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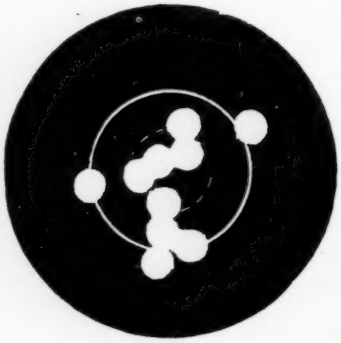
$3.00 the year

20 cents the copy

"Clean Across the Range"

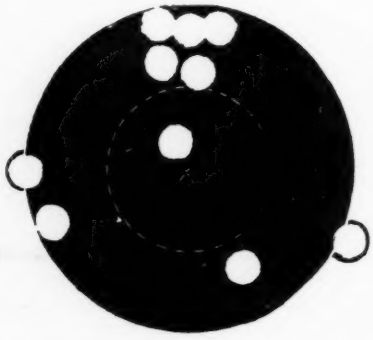
In the vernacular of the rifle range this means that the shooter placed all of his record shots in the center ring or bull's-eye at all stages or distances of the match. That's what McGarity, wizard of the small bore, did at Sea Girt during the Eastern Small Bore Championships. It requires real marksmanship and the finest equipment to do it but with dependable ammunition, a good gun and a stout heart, with a few things like eyes, nerves, and coordination thrown in for good measure, anyone can achieve the goal.



50 YARDS

Composite of 10 shot target made by R. H. McGarity in Eastern Individual Match—Score 100.

R. H. McGARITY
Eastern Small Bore Champion



100 YARDS

Composite of 10 shot target made by R. H. McGarity in Eastern Individual Match—Score 100.

Remington Palma .22 Long Rifle cartridges are used by those riflemen who have scaled the natural obstacles in the path of the inexperienced, the unbeliever, and the doubting Thomas.

When you hear about World's Records in shooting, you will probably find that Remington Palma .22 Long Rifle or .30 caliber ammunition were used. Most of the world's records for rifle shooting are made with

REMINGTON UMC

REMINGTON PALMA

THE ACCURACY CARTRIDGE

REMINGTON UMC

Another International Team Backed by HiVel

The U.S. 1925 International Rifle Team, now in Switzerland, is backed by what has been proved by public test to be the most accurate 300 metre cartridge ever submitted for the approval of an ammunition board.

Frankford's Lot 2, which is the official ammunition used, is loaded with a new 172 grain, 9°, boat-tail bullet and 37.6 grains of Hercules HiVel Powder. This charge develops 2200 foot seconds velocity at 78 feet and a breech pressure of only 29,545 lbs. per square inch.

At the Aberdeen Tryout this super-accurate 300 metre load made 10-shot groups which averaged 1.88" extreme vertical by 2.33" extreme horizontal. For years ammunition that would shoot within one minute of angle or 3.29"x 3.29" at 300 metres, was the ultimate goal of all manufacturers. But this new HiVel load shoots groups little more than half this size.

It tested at 100 yards, such ammunition would cut a ragged hole in the X ring of the small bore target and make a group less than the size of a dime.

HiVel is, therefore, again backing an American International Rifle Team with a practical form of "moral support." There is nothing that gives a shooter confidence like the knowledge that when he holds a ten he'll get a ten.

HERCULES POWDER CO.

908 King Street

Wilmington, Delaware

The Sea Girt Bull's-Eye

SATURDAY, AUGUST 1, 1925

SPENCER MATCH WINNERS SHOOT US .22 N. R. A.

Hilborn, Dawson and Proudman Win High Places

SEA GIRT, N. J., July 5.—Jerry M. Hilborn of the Roosevelt Rifle Club, New York, won the 200-yard small-bore Spencer match of the annual Eastern small-bore classic which closed on the State rifle range today. H. W. Dawson of Brooklyn and Dr. E. H. Proudman took second and third places respectively. The match was fired from the prone position and consisted of two sighting shots and twenty for record.

Hilborn, who won the same match last year with a score of 99, turned in a tally of 100 - 10 V's, outranking his nearest competitor by one point. The Frazee Cup, the Arlington Rifle Club Prize and a cash award all went to the winner.

Hilborn's equipment consisted of a Peterson-Ballard rifle, Fecker 'scope and US .22 N. R. A. long-rifle cartridges. The cartridges were of the same make as those with which he won the match last year.

Both Dawson and Proudman shot Winchester rifles and US .22 N. R. A. ammunition. Although their scores were equal, 99 - 10 V's, Proudman was outranked.

RUSS WINS LONG-RANGE INDIVIDUAL

Proudman Wins Second Both Shoot US Ammunition

SEA GIRT, N. J., July 5.—Shooting US .22 N. R. A. cartridges, Harry Russ of Wilkes-Barre, Pennsylvania, and Dr. E. H. Proudman won first and second places respectively in the individual long-range match held here today. The match, which was shot at 200 yards, was open to any competitor who had never won first, second or third place in any previous open shoot.

Russ, who shot US N. R. A.'s in a Springfield rifle, turned in a perfect score of twenty consecutive bull's-eyes. Proudman registered 95 - 7 V's.

Earns Trip To Camp Perry

By winning the Camp Perry special match with a score of 394, L. J. Miller of the Frankford Club, Philadelphia, earned the expenses of a trip to the matches to be held later in the summer at Camp Perry, Ohio. Miller shot US .22 N. R. A. Cartridges.

HESSION MAKES WORLD'S RECORD PALMA SMALL-BORE MATCH SCORE

A Record-Breaker

John W. Hession and Harry M. Pope

Four Highest Men Shoot US .22 N.R.A. Cartridges

SEA GIRT, N. J., July 4.—Making a continuous run of 102 consecutive bull's-eyes with US .22 N. R. A. cartridges, J. W. Hession of the Roosevelt Club, New York, broke all records for the Palma small-bore course and the Palma individual match today. The course consists of two sighters and fifteen shots for record at 150, 175 and 200 yards.

Hession first shot the course in the individual match scoring a world's record for the match—225 x 225 - 28 V's. Following this spectacular shooting he again went over the course in the Palma team match. It was during this match that he broke the course record by registering 225 - 33 V's.

Hession's marksmanship is all the more remarkable in view of the fact that his shooting was done in a wind which switched from nine o'clock to one o'clock in the morning and fishtailed from eleven o'clock to five o'clock in the afternoon.

His equipment consisted of a Pope-Ballard rifle, Fecker 'scope and US .22 N. R. A. long-rifle cartridges.

Second, third and fourth places in the individual match were won by J. W. Gillies, C. H. Johnson and J. M. Hilborn, all of whom shot US N. R. A.'s.

SET WORLD TEAM MARK

Three Teams Break Old Record

SEA GIRT, N. J., July 3.—Three four-man teams set a new record in the Palma small-bore team match today, each team making 889 bull's-eye totals out of a possible 900. Of the twelve men on the three teams, the ten with the highest scores shot US .22 N. R. A. cartridges.

The White team and the Red team of the Roosevelt Rifle Club won first and second places respectively, while the Frankford Arsenal Club team took third place.

One Make of Ammunition Takes 65 per cent of All Firsts

NEW YORK, N. Y., July 6.—The results of the annual Eastern small-bore rifle tournament held at Sea Girt verify statements issued occasionally by the United States Cartridge Company from their headquarters at 111 Broadway, New York, N. Y. It is claimed by that company that their US .22 N. R. A. long-rifle cartridges are "the choice of champions;" that "they hit where you aim;" that "'possibles' are 'probables'" with their straight hitting .22's.

The absolute truth and soundness of these statements have been borne out again by the Sea Girt matches. Sixty-five per cent of all of the first places in the squadded matches were won by shooters of US .22 N. R. A. cartridges; thirty per cent more than all other makes of ammunition combined.

US N. R. A.'s have long been recognized as the most dependable ammunition available by the foremost shooters of small-bore rifles, both in this country and abroad. They were the cartridges which cleaned up at the Olympics last year and at the Metropolitan and Pope matches this year.

100 Yard Re-Entry

E. H. Proudman, who was tied for first place in the 100-yard re-entry match, together with Gillies, Hilborn and Betts, who tied for third place, shot US .22 N. R. A. cartridges.

Proudman made a "possible"—300 x300.

"Jerry" M. Hilborn Wins Individual Aggregate

"Jerry" M. Hilborn of New York, having the highest total score for the Spencer, Palma and Eastern individual matches combined, carried away the honors of the Individual Grand Aggregate at the Sea Girt matches. His score, 568 x 575, sets a new high mark for this classic.

Hilborn's total was made up as follows:

Eastern small-bore	244
Palma	224
Spencer	100
TOTAL	568

Hilborn, an executive of the Roosevelt Rifle Club, New York, has long been prominent among small bore marksmen. He has placed himself well towards the top in many of the matches which he has entered and in several instances recently he has taken first place.

Both Mr. Hilborn and Mrs. Hilborn, who invariably accompanies her husband to matches, have for years shot US .22 N. R. A. long-rifle cartridges.

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The Future of Game Shooting

By Charles Askins

THE subject I am to handle is a rather ticklish one, for the reason that nearly all magazines are afraid of it. However, the Editor of THE AMERICAN RIFLEMAN doesn't care a cuss for anything or anybody, which greatly simplifies what would otherwise be a problem in publication.

From the licenses sold and from other sources, it is estimated that there are six million shooting men in the United States. It is further estimated that, making a fair bag, we have no more than game enough for two million shooters. Here we are then, six million shooters who ought to be content with what would be a fair bag for one third the number. Of course the six million are all trying to make bags and the result is a steadily declining game supply.

The Federal Migratory Bird Law helped, but in spite of it the duck problem is now in the position that the wild pigeon situation once occupied. People are saying, "Oh, there are lots of ducks, but they are taking a little different route from the one they followed last year." Yep, a lot of them have taken a little different route, a route into Kingdom Come.

People are having a lot more fun than they used to have when I was a boy. They have the automobile, picture shows, the radio, basketball, tennis, school athletics and flappers. I remember when the only amusement we had was baseball, shooting, and a hay ride. Now what in thunder is the reason that everybody wants to shoot, and that game is being harried from every odd corner of the United States. Who is doing this shooting anyhow, and what makes him do it?

Of course we have the automobile and the facility with which game grounds can be reached as compared with what used to be the case. Moreover, we have the good roads movement. Even in the wildest section of the country the Forestry Department is busily engaged in building new roads into the heart of the big game reserves. If there is any spot in all our mountain regions where big game exists and where the automobile cannot drive right into the middle of it, the Foresters mean to see that a road is built with the least possible delay. The darn chumps had better block the roads that now exist, seeing to it that the man who got in there earned his way on foot or horseback.

I didn't start in to handle the automobile problem, however, for it is past solution. Time was when the farmer and the farmer's boy shot a great deal, maybe for market, maybe for amusement, lacking anything else. It is different now. The farmer has his car, his radio, and a good many other things that cost money and serve to entertain him. Guns and ammunition are high and he is buying very little of either. So far as he concerns himself with game at all, he is a conservation element. He doesn't shoot quail because it costs him ten cents a bird and ten cents will buy a half gallon of gas. Who is killing the game then, and why does he do it? The answer is the man from the cities and the towns, and the reason he does it is the romance of the thing.

The shooting man of today is a reading man, and his bent is governed by the things he reads. Here is the situation as I see it. Take myself for instance. I earn a living by writing of guns and ammunition and shooting. The greater the number of men I can convert to game shooters the larger my clientele, the more valuable my writings for the magazines, and the better wages I am going to command. Of course I am going to write as enticingly as I know how of the delights of wing shooting or some other form of shooting. Thousands of other men are doing the same thing—combined we are having an effect. The man who reads what Askins or Crossman writes of guns is going to want a gun or he wouldn't read about guns, and of course he has to use the gun. The man who reads what Fred King says of quail shooting is going to shoot quail. And Wm. Barber Haynes has the same effect on duck shooters. Of course there are hundreds and hundreds of other men who are writing after the same fashion. Therefore the shooting men of today are converts of the shooting writers of today, and we are converting altogether too damned many, if you get me.

How can the writers on sport do this thing? Through the sporting magazines. There are ten sporting magazines now to where there was one only a few years ago, and a new one is making its debut about once a week. There are altogether too damned many of them now, you get me. Sure! The more magazines devoted to field sports the sharper the demand for the stuff I write the more money I can make, but I am not writing in my own behalf today but in behalf of game. I am not writing

in behalf of the sporting magazines either, and of all such magazines that are familiar to me THE AMERICAN RIFLEMAN is the only one which would dare to publish this article. To sum up, the sporting writer, through the sporting magazine has converted and prevailed upon and enticed six million men to shoot where two million would have been a lord's plenty. The end is not even in sight, although various men are beginning to speculate as to just what that end is to be.

One large branch of the shooting fraternity, with which we all sympathize and would further, is the Isaac Walton League. This League holds that the answer lies in conserving and preserving natural game resorts. The league would prevent useless drainage of duck and snipe marshes, and would set aside great bodies of water and marsh as public shooting grounds. Nobody can find fault with the aim or the object or the results, as far as these can go. Nevertheless, I am not so optimistic as the Isaac Walton League appears to be. I am afraid that if the whole big state of Illinois were set aside as one great game preserve. stocked with ducks and snipe and quail and grouse—heavily stocked all over the state—it would be shot out in one week of open season, granted the shooting public was free to do this thing. Through good roads and their automobiles, about two million of our six million shooters would find themselves within reach of Illinois. Any open game reservation on a minor scale would find itself in precisely the same fix.

Granted that the Isaac Walton League or any other league of sportsmen fails in the endeavor to secure shooting for all of six million gunners, what next. Capt. Paul A. Curtis, Jr., says that the answer is plain to him. He maintains that we are no different from any other white people, no different from the people of England or Continental Europe. We, he says, will have to solve our shooting problem just as it has been solved over there. That means in a word the end of free shooting and free shooting grounds, and that nobody is to shoot except that he is willing and able to pay for that privilege. In the briefest terms, he will either have to belong to a club that owns or leases shooting rights or he will have to own or lease shooting rights individually. The captain further maintains that the good things of this world are just about morally certain to go to the man with power enough to get them. In marriage and mating, youth, good looks, brains and money win first choice; in shooting money alone is to do the trick. The man who is bedeviled by the shooting instinct and has money is going to shoot, while the man who is bedeviled by the shooting instinct and has no money is simply going to be bedeviled.

It wouldn't surprise me at all if the captain proves precisely and exactly right in the end. I do not like to think so, though, and I do not like the idea of following England in any one darned thing. Under the Curtis scheme it is going to take money to shoot. The least money for which a man can secure any sort of shooting will be about one hundred dollars a year, and fair shooting will cost no less than five hundred. From that on the annual outlay will run to perhaps a hundred thousand a year. This plan would cut our six million shooters down to possibly five hundred thousand shooting men in the whole United States. Game ought to increase, and I believe it would.

I believe Captain Curtis is quite right about the necessity of cutting down the numbers of game shooters, and he is no less right concerning the need of the men who shoot of paying for the privilege. I do not like any plan so undemocratic, however, except that no other scheme can be made to work. At the same time we just simply have to get rid of four million of the six million gunners that we have now. How is it to be done? Well, I'd simply raise the shooting license so high that the fellows would quit. All over the United States the resident shooting license should be raised to twenty-five dollars the gun. Enforce such a law as that, and two thirds of our game shooters would quit right now, and the other third would find something to shoot at. If twenty-five dollars the year didn't do the trick, fifty would. The principle involved is that shooting should be as free to one man as to another, except that the man who did shoot would have to pay his government for the privilege. Could such a license law ever be passed? The answer is, no, except part of the license money be paid to the man upon whose land the game was found. That would bring the farmers into line, and they would not only vote for the law but would turn themselves into very efficient game wardens.

Can anything further be done by reducing bag limits, shortening seasons or closing seasons altogether. Not much more can be done; we have about reached the limit in that direction. If every state in the Union were to pass a law entirely forbidding game shooting I doubt if we would have any more game in twenty years from now than we have today. Public shooting grounds are beautiful in theory and in practice will prove worthless. If seasons are never open the game would still be shot in all seasons. Game coverts will steadily decrease unless we make it worth while to the man who owns them to see that they are preserved. One way or another the money of the sportmen will have to be used in this direction, and no other plan will work. But keep in mind all the time that by some means or other our present six million gunners will have to be decreased to two millions. *Any scheme whatever which fails to do this must prove entirely worthless.*

What is a man to do then who has shooting born in him or has developed it. Why bless you, there is the rifle and there is a black spot in a white paper and there is vermin. Why a man can take his small bore rifle out into the woods all by himself and have a world of fun, with nothing to shoot at except his small bore target. Maybe he makes 96 today, but it was only hard luck that he didn't get a 98. Tomorrow he will do better and he is impatient for tomorrow. The next week he gets his 98, and presently a hundred straight. Now he is ready for good company, and all in due time he shows the other fellows what he can do, and incidentally they show him what they can do, too. By and by he is in the expert class and talks learnedly about the necessity for putting a V ring into the two inch center of the one hundred yard target. If the thing doesn't entertain him, there is a screw loose in that chap's make-up, his engine is knocking and he'll have to be overhauled. And anyhow all that it is costing him is the cost of ammunition and helping to pay somebody for spotting his shots.

What about big game shooting with the rifle; wouldn't that cost money too? Sure, but big game shooting in America doesn't amount to much. Killing a deer is like eating a turkey for Christmas dinner—doesn't come but once a year and not what it is cracked up to be at that. In these days of powerful rifles how much skill is required to kill a deer? I remember my father telling me of his deer shooting. He had a muzzle loading rifle with just about the power of a .25-20, and he knew that the limit of his range was about seventy-five yards; he knew that his bullet had to be placed in one of three vital places, the heart, the neck, or the head, and that if he could not hit one spot or the other it was no use to shoot. He killed in the fall of the year from October to Christmas about one buck a week, with turkey hunting between times, and now and then a bear. I can see where the fun came in. Now, even in such big game states as Arizona and New Mexico, we are allowed one buck a season. In shooting this buck, we have a rifle so powerful that we have but to bury the bullet in any part of his carcass and down he goes. If we shoot at his heart and hit two feet away in his tail end, down he goes on the spot. It is sport for the patron of a "Dude Ranch" with a 400 bore Whelen rifle.

What about vermin? Any sport in vermin shooting? John Wallace Gillies wrote me recently that he had just killed a woodchuck at a quarter of a mile. Looks impossible doesn't it? But he used a Niedner .25 caliber rifle with a velocity of 3,100 feet and superb accuracy, mounted with a Fecker ten power scope, so that the little beast looked less than fifty yards away. He could see the chuck's eyes gleam and the twist of its nose scenting for danger. Anyhow he hit it, and he will remember the shot long after he forgets where he shot the last deer. Another man wrote me that he had killed twenty-four chucks that day, also with a high velocity rifle and telescope sight. It all looks like good fun to me. In the West we have the jackrabbit, and he can be seen and shot at any distance up to a quarter of a mile. It is real practice for the rifleman, and no license fee ever will be required—neither will a meager game supply be lessened. Here we have occupation and entertainment for our four million surplus game shooters, who will be welcomed everywhere instead of meeting "keep out" signs. Anyhow we have those four millions of surplus game shooters and are going to get rid of them, unless they are willing to pay the piper to the tune of not less than a hundred dollars a year.

A Remarkable Old-Timer

By Maj. G. P. Wilhelm

THE marvelous performance of modern rifles, ammunition and riflemen, as evidenced by the superb records made at Perry every year, tend to make one feel that the shooting feats of our ancestors were exceedingly crude to say the least. History, however, records prodigious acts of marksmanship, which show that we of the present generation are little, if any, better than our forefathers.

Classical history has passed down many a feat of arms that has held its own with the best of modern fish, radio, golf and shooting stories. For instance, there is a Greek story (classical, not restaurant), the full particulars of which I have forgotten, but which runs something like this: During the siege of ancient Corinth there flourished in that day a writer of lines known as Pindar the poet. Among the small bore shooters of the besiegers, there was a certain archer who was the Wimbledon winner of that Olympic age. Pindar, being privileged as a member of the press, made disparaging remarks about the shooting ability of his friend, and allowed that no archer had ever been known to hit anything smaller than a flock of barns. The bow and arrow artist thereupon wrote a brief note, addressed as follows: "TO THE RIGHT EYE OF PINDAR, THE POET." When Mr. Pindar was picked up later by the Red Cross, the note was found attached to the arrow protruding from the gentleman's right eye. This is the first historical example of a marksman "calling a shot" as David when he slew Goliath failed to predict that his stream line stone would land in the four ring at 12 o'clock.

Over 2,000 years later the art of shooting had so deteriorated that Lord Nelson's idea of the target was a battleship at fifty yards. Sights were "damn Yankee" gimracks.

Ancient history, you may say, but some of the ancient history is not easily duplicated. For instance, the cut shows a 2,000 yard target made by a Springfield caliber .30 rifle in 1891. The firing was done by Mr. Freeman R. Bull, who had the remarkable record of having worked for the Government at the National Armory, now Springfield Armory, for 51 years as gun tester, gauge maker and tool maker. The present Mr. Bull of the Experimental Department at Springfield Armory is a son of Mr. Freeman R. Bull.

In order to realize just how good this target is, let us go back a little in history. Caliber .30 rifles were few and far between at that time. In fact we find no less an authority than the Chief of Ordnance stating unqualifiedly 13 years previously that, "The present improved arm cannot be rendered worthless by the introduction of an improved weapon, because as long as small arms are fired from the shoulder, and the propelling force is gunpowder, the caliber of gun and dimensions of cartridges, now regulation, will not be changed, and the improvements will only consist in more rapid manipulation and increased rapidity of fire." (Extract of report of Chief of Ordnance, 1878.)

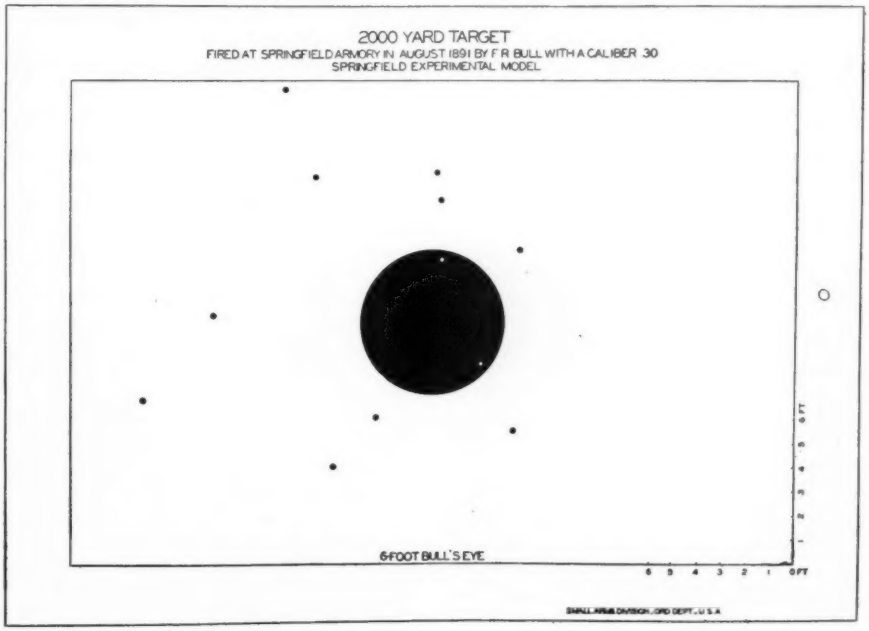
The weapon which he was referring to as "the last word" in shoulder arms was the Springfield Breech Loading Rifle, Model 1873, Caliber .45. This weapon was superseded in 1884 by the same arm with a rod bayonet, and, in 1892, by the first Krag model.

Mr. Bull, in making this target, used a muzzle rest. The bullet, of course, was the 220 grain Krag type with a muzzle velocity of about 2100 f. s. It was fired with service sights. While the target was 12 feet high by 20 feet wide with a 6 foot bull, yet the shooting was extremely good. Two shots went over the target and one under.

Mr. Bull was one of the most remarkable shots that this country has produced. In the early 70's, the Springfield rifle had a poor reputation as an accurate weapon. Mr. Bull put it on the map so to speak. During the 80's, Mr. Bull and the Massachusetts Rifle Team were unbeatable, both in the United States and in England. Mr. Bull, himself, held many important records, and won innumerable medals. At one time he was as entitled to be called the champion rifle shot of the world as it is possible to be.

Mr. Bull was the "machine rest" of his day. At the present time, when a new ammunition is adopted, ballistic firings are held from concrete piers upon which are mounted

A Special .45-70 single shot made by Mr. Bull for Match work. Note the heavy octagon barrel and the prong on the butt plate. The 1925 International Team is using butt plates of this identical type.



heavy mechanical devices, holding Mann "V" blocks equipped with large cylindrical testing barrels, in order to eliminate the personal error. From these firing the graduations of the sights are determined. Mr. Bull evidently had a very small personal error, as he did the firings with the Springfield rifle for graduating the old Buffington sight. These firings were from 100 to 2,000 yards, using a muzzle rest.

So accurately did he do his work that I expect to make a comparison of the groups made then with modern groups in a later article.

One of his remarkable performances with the rifle was the record he made in 1887 for the gold medal of the Armory Club. The course of fire called for ten scores of ten shots each, every one fired on a separate day and with a different Springfield rifle, taken from the daily produce without alteration. During this series he made seven scores totaling 49 out of 50 and three scores totaling 48 out of 50. He made another record much earlier than this in 1877, when he scored ten consecutive bull's-eyes with the Service rifle and Service ammunition at 500 yards in the prone position. At that time the Service rifle was the perfect weapon referred to in the Chief of Ordnance's report.

At the age of 75 Mr. Bull attended the field day of his old company in the Massachusetts Volunteer Militia. During the shooting contests, he won both the 200 and 500 yard matches against all comers, including the younger members, using no eyeglasses.

Other interesting facts about this unique man will probably be of interest. A great deal of the design work on the Service sights from the time of the old Springfield down to and including the present Springfield was done by Mr. Bull. He was one of the first men in the United States to experiment with metal jacketed bullets for military use. In these days of specialized trades, it is interesting to note that he made all of his own guns and all models for the Government at that time by hand, including the rifling of the experimental barrels. In fact, in addition to being the most important shooting cog of the American Team which won the World's Championship in England in the 80's, he also rifled all the barrels by hand and assembled them for the use of his team.

He was a practical man and not a theorist. In graduating rifle sights he made his graduation marks by actual firing. When he required a master gauge he made it. Some of the gauges used at Springfield Armory at the present time are said to have been made by him.

The character of Mr. Bull is best shown by his habits. For instance, if a speck of metal from one of his machines flew into his eye, he would sharpen up the point of his knife blade, go to a mirror and pick it from the ball of his eye with the naked blade. He should have been a surgeon, as well as an ordnance expert.

Such men are makers of history. He was one of the last of that race of American craftsmen who made the American rifle what it is today. His shooting records make us believe that the legends of the rifle in the past, both with regard to its use in war and in hunting, were literally true.

The character of the times served to develop such personalities and it is only in this way that we can account for the accomplishments of the past. I can almost persuade

Freeman R. Bull in the old uniform of the Massachusetts Volunteer Militia

myself of the truth of Mr. Sawyer's wondrous tale in "Our Rifles" where a Captain of Engineers in the Civil War killed an officer at one mile, one hundred and eighty-seven feet (why did Mr. Sawyer omit the inches), using a heavy target rifle mounted like a cannon. Mr. Bull might have conceivably pulled off such a stunt.

Cynics say the shooting feats of the past were flukes; the incredulous, and this includes the rest of the world, as well as Missouri, say they were never done; but the hero worshipper whose number is legion claims it is skill.

While paying tribute to such men as Mr. Bull, let me briefly show what has been accomplished in rifle shooting since American history grew glorious.

During the early days of George Washington we have a true picture of the state of firearms of that day in all armies by the massacre of Braddock. The trained soldier of that day was furnished with a smooth bore musket and he was not taught to aim but merely to point it in the general direction of the enemy and pull the trigger by command in volley firing. Braddock's men shot only the trees, and not Indians, and if there had been but few trees they would have missed them.

The British army for a century and a half had as a regulation arm a smooth-bore flintlock musket dramatically known as "Brown Bess." From the time of Cromwell until Wellington there was little change, guns were merely good handles for bayonets.

Even that great military genius Napoleon withdrew the rifle from what few troops it had been issued to and it was not used again until 1830.

Hunting weapons were well made but military guns were such a joke that the old gunsmiths used to say, when they referred to a particularly bad weapon. "Why, sir, she be no more use nor a soger's musket."

During Napoleon's campaigns 450 yards was considered a safe distance from all small arms, the rifle included.

The success of the American rifle in the Revolutionary War and with Jackson at New Orleans in the War of 1812 was the beginning of the universal use of rifled arms in war. But it took another century of work on the part of American genius before it was possible to accomplish in war what was done by the first British Army in France and by our own divisions in the latter part of the World War.

From the battle of Crecy, when gun powder was first used, until the general adoption of rifled arms was about 500 years. More progress, therefore, has been made in the last 100 years than was made in the previous 500.

Such an advance was only made possible by American industry and it was such men as Mr. Bull who made up American industry. The day of the individual in rifle manufacture is over. No man now occupies the place which was filled by Freeman R. Bull for fifty because no such person combines in the individual the qualities of gauge maker, tool maker, ballistic expert and rifle shooter.

One of the reasons for the success of Mr. Bull was because his work was his hobby. He lived and thought guns habitually. He was not merely interested in his work while in the office, but it was continually in his mind.

Like the guildsman of old, he was proud of his handiwork. In these days of quantity production, the individual is merely a machine operator. He neither knows nor cares what sort of a complete machine will be assembled from the units which he is making. He works in short shifts—the shorter the better. The modern industrial system does not make for individual genius.

All honor is due to such men and to the period in which they developed the present perfection of that marvelous piece of mechanism and engine of modern war, the American rifle.

The Big Three

By J. V. K. Wagar

WHEN one reads of the Big Three on the pages of a newspaper, the text usually concerns itself with football games involving Yale, Harvard, and Princeton. Of coure there are a lot of other teams about the country which can lick the tar out of any of them, or who at least think they can, but, to anyone except alumnus of some other university than one of these, they are still the Big Three.

When one reads of the Big Three on the pages of THE AMERICAN RIFLEMAN, in a dissertation on revolver cartridges, that person is reading something about the .38-40, .44-40, and the .45 Colt. There are folk who might try to include the .44 S. & W. Special or .45 Auto. Colt among the Big Three, or who might try to enlarge the Big Three to a Big Four or Big Five, but of course they couldn't get away with it.

These cartridges were first used in revolvers some time around or in the eighteen-seventies; a fact which credits them with fifty years of satisfactory service. Had that service been less satisfactory, the .38-40, .44-40, and .45 Colt would have passed in the same manner in which the .41 and .44 Colts left us. As it is, they are three of the very most popular six-gun cartridges except with those who do little else with revolvers than military and target shooting. Those who need or desire the utmost power in a six-shooter seldom consider any other cartridges than the Big Three.

We Americans have long been world-famous for our ability in the use of powerful revolvers. A very large portion of that renown was acquired during the days when the Single Action Colt was the favorite revolver. And I very seriously doubt if the Single Action Colt would have earned its great prestige with lesser cartridges than these.

The Big Three are the only three American side arm cartridges which have not been duplicated abroad. The British have an auto. pistol cartridge so very simlar to our .45 Auto. Colt cartridge that the difference is negligible, excepting the difference in bullet shape. The .44 S. & W. Russian was designed for a foreign army and is nearly as popular abroad as in this country. The .25, .32, .380, and .38 Auto. Colt pistol cartridges have their European counterparts. And so on, endlessly. Only the Big Three are so typically American in their punch and recoil that side arm shooters of other parts of the globe have left them quite thoroughly, if not entirely, alone.

One of the greatest advantages associated with the .38-40, .44-40, and .45 Colt is the ease with which one can procure any of these cartridges. Almost every hardware and sporting goods store in the United States and Canada, except those in the very most settled districts, have the .38-40 and .44-40 always in stock. The .45 Colt is obtainable almost anywhere between the Mississippi and the Pacific, and in any sizable community elsewhere in the United States.

It was in the latter part of 1919 that I first realized the importance of this advantage. I was then working in a northern Wisconsin lumber camp and had with me an S. & W. Military and Police Square Butt revolver shooting the .38 S. & W. Spl. cartridge. I had not followed my usual practice of buying a large amount of ammunition before going into the country, and soon depleted my small supply.

Then the trouble began. I'd go into one of the few small general stores in that country and ask for .38 revolver cartridges. I didn't care if they were the .38 S. & W. Spl. or Colt Special, .38 Long Colt, or .38 Short Colt cartridges; just something I could use in my revolver. Always the storekeeper would bring out a box of .38-40's, reading from the box that they were for Winchester rifles and Colt revolvers. I could get nothing to shoot in my gun, and the storekeepers were unwilling to order cartridges for loggers, because of their transitoriness, unless paid in advance.

That Smith & Wesson revolver was a splendid arm, killing two deer and much smaller game, but I've never carried a revolver chambered for the .38 S. & W. Spl. cartridge since that time, except on short trips near home. The .44 S. & W. Spl. cartridge is even worse, unless one has a S. A. Colt revolver fitted with an extra cylinder for the .44-40 cartridge, because it is most often sold only in towns inhabited by target shooters.

Not only are the .38-40, and .44-40 and .45 Colt cartridges easily obtained but, power considered, they are the cheapest of revolver cartridges. The .38-40 and .44-40, because of their great popularity among riflemen as well as six-gun men, are particularly inexpensive. They cost considerably less than cartridges for the .38 and .45 Automatic Colts, usually less than cartridges for the .44 S. & W. Spl. and not a great amount more than cartridges for the .38 S. & W. and Colt Specials. Even the .45 Colt, heavily loaded as it is, costs little or no more than .44 Special cartridges and materially less than the most powerful automatic pistol cartridges. Any of these three cartridges—the Big Three—is recommended to those who never expect to reload, who cannot afford to spend an exorbitant sum of money on cartridges, and who, despite all this, desire or need a revolver which shoots the very most powerful charges.

There is considerable doubt concerning the relative efficiency of these three cartridges, but it requires a man with more nerve than I possess to arrange them in the order of their killing power. I have used them all on game and two of them on very large game. At times I have thought each of them the best killer, only to completely reverse my opinion a little later.

The penetrations of the .38-40, .44-40, and .45 Colt bullets are surprisingly the same over a great number of shots. The bullet of the .45 Colt travels slowly, but penetrates to a good depth because of its heavy mass of lead and because its lines are slightly finer than those of the .38-40 and .44-40. I am speaking, by the way, of the most powerful .45 Colt loads, with 255 or 260-grain bullets having a rather small flat point. The lighter .45 Colt loads, with lighter bullets having rather large flat points, and with rather light charges of black or smokeless powder, will not equal the .38-40 and .44-40 in penetration. The bullets of the .38-40 and .44-40 are light in weight and flat of point, diameter considered, but penetrate deeply because of good velocities.

Since the bullets of the .38-40 and .44-40 have flatter points than the bullets for the .45 Colt, they should disturb the flesh of an animal to a greater extent, bullet area considered. This is undoubtedly true but the .45 Colt, because of its greater diameter, fully equals them in the rending of flesh, although it has finer lines forward. The .38-40 possesses the highest velocity of these three cartridges and therefore expands its lead to a greater extent than does the .44-40 with less velocity. The .45 Colt, because of its rather low velocity, expands its bullets the least. When all this penetration and expansion is over, the bullets have penetrated quite uniformly to the same depth and have about the same cross-sectional area. I have recovered quite a number of bullets from wood and from heavy animals, and find that the solid lead bullets of the .38-40, .44-40, and .45 Colt, which usually caliper .400, .424, and .455 inches before being fired, will quite uniformly caliper .460 to .470 after penetrating wood, or tough skin and cartilage and light and medium weight bones. The velocities which are responsible for this uniformity of expanded diameters are 985.8, 918.8, and 770.6 respectively.

All experiments that I have been able to conduct prove quite emphatically that no existing revolver load has sufficient velocity to produce anything simulating an explosive effect. Furthermore, the really slight difference in velocity between the very highest velocity cartridge and that having the lowest, means no advantage except in a better trajectory, increased bullet expansion, and deeper penetration. The difference in shock, due to velocity alone, is negligible. The killing power of a revolver cartridge depends upon

bullet area, bullet shape, bullet expansion, and penetration.

On very small animals, the revolver bullet with a large cross-sectional area and a very flat point is the best killer. Penetration is negligible on such game because all of our center fire revolver cartridges have sufficient penetration to completely pierce them. Expansion is also of little importance because such animals as rabbits, gophers, cats, porcupines, etc., offer so little resistance to a bullet that expansion cannot occur.

For a moderately tough, medium-sized animal, such as a pig, any larger member of the dog tribe, man, and perhaps deer, penetration, bullet area, expansion, and bullet-shape are all of considerable importance in a revolver load Sufficient penetration to pierce ribs, and to then reach vital organs is needed, and a bullet must be large enough, flat enough, and must expand sufficiently to disturb the greatest possible amount of tissue all along the way. No revolver loads possess these characteristics all so well-developed as do the .38-40, .44-40, and the .45 Colt.

Grizzlies and moose have been killed with side arms. It is courting death to do so but, in all the killings I know about, it was surer death to not attempt to kill these beasts; for the men involved were being attacked. In killing such game, penetration is by all odds the most important attribute of a side arm cartridge. Thick, tough hides, heavy bones, and firm flesh must be pierced before the bullet can reach organs which act as the seat of life. Diameter and flat point must be sacrificed in order to increase penetration. The cartridges which have made good to the most remarkable extent are the .30 and 9 mm. Luger and .38 Auto. Colt. These do possess matchless penetration, although they are inferior to the Big Three on deer, black bear, mountain lion, and other such game which might become dangerous under certain circumstances. For such game, as well as for the lesser but tough game more properly within the province of six-gun shooting, it is well to sacrifice a little penetration in order to gain greater diameter, expansion, and meat tearing.

The .38-40 and .44-40 offer the shooter a greater variety of bullets than can be had in the .45 Colt. Solid lead bullets, hollow-pointed lead bullets, soft-pointed metal-cased bullets, and full metal-cased bullets (hard-nosed) may be had in these two. Of these, the hollow-pointed bullets give the greatest mushrooming and the least penetration, but only on fair-sized game. Game of a size, or smaller, than our rabbits will not expand these hollow-pointed bullets at the reduced velocities with which they are shot from revolvers. The hard-nosed bullets give the maximum penetration and the least deformation. In fact, I have dug several full metal-cased bullets from game and these show absolutely no noticeable deformation. The soft-pointed, metal-cased bullets expand considerably less than the solid lead bullets because of the tough metal jacketing carried well up the side of the bullets.

Only solid, lead alloy bullets are made for the .45 Colt, and these expand very little, unless bones are struck, because of the very low velocity of the .45 Colt. Although these bullets have flat points, their area is considerably less than those on the .38-40 and .44-40. The .45 Colt must, because of these facts, depend largely upon its bullet diameter for its killing power, and but little upon its flat point and expansion.

Solid lead and metal-cased bullets for the .38-40 and .44-40 invariably weigh 180 and 200 grains, respectively, in any factory loads which can be used in revolvers. The .45 Colt bullets weigh 250 or 255 grains, in factory loads, according to the brand of cartridges purchased. Reloader's molds, cut for the .38-40 and .44-40 bullets, usually cast bullets of standard weight and design, but almost every make of mold for the .45 Colt casts a bullet of differing weight and pattern.

The .38-40,, .44-40, and .45 Colt are loaded, in black powder, with 38, 40, and 38 grains respectively. All of these cartridges foul revolver barrels very badly, when loaded with black powder, and are much worse in this respect than the .44 S. & W. Russian and Special cartridges, which have much lighter powder charges in relation to their bullet weights. Of the Big Three, the .38-40 fouls the worst because of its light bullet, heavy charge of black powder, and sharply bottle-necked shell. The .44-40 is practically as bad, since it has almost the same ratio of powder and lead, although its bottle-neck is much less pronounced. The .45 Colt fouls the least of these cartridges, although all of them have this fault to such an extent that many shots cannot be fired with black powder without a considerable loss in accuracy. Spitting or squirting water into the barrel after every few shots will keep down the deposit of soot, but anyone expecting to shoot a great number of shots, in rapid succession, should use cartridges loaded with smokeless powder.

An excess of black powder fouling affects the accuracy of these cartridges in varying manners. The bullets of the .38-40 and .44-40 become quite erratic and simply will not group well. Quite often I have seen them scatter themselves about the target at all distances and directions from the point at which one aims. The .45 Colt bullets, on the other hand, perhaps because of their longer bearing and greater weight, usually fly off in a given direction for each individual gun, the distance between the bull's-eye and the bullet holes increasing with the amount of fouling.

The smokeless powder with which the .38-40 and .44-40 are loaded is a rifle smokeless powder which, like black powder, will not be entirely consumed in the short barrels fitted to revolvers. Because of this, the velocities developed with the use of these rifle smokeless powders in revolvers are much lower than those developed with the same charges of powder and lead in rifles. There is, undoubtedly, a considerable amount of unburned powder thrown out at the muzzle.

With pistol smokeless powders, which are designed to burn more completely in the short barrels of side arms, much less unburned powder is blown past the muzzle and the differences in velocity of these loads, when fired from short and long barrels, are not so great. These are facts fervently cited by those who dislike the .38-40 and .44-40 cartridges for use in revolvers. But, even granting that all this is so, the .38-40 and .44-40 have considerably higher velocities and much more killing power than standard loads for the .38 and .44 S. & W. Spl. and other revolver cartridges. Compare them at 200 yards, noting their trajectories, and then sit in the rifle butts at 200 yards and listen to the .38-40, .44-40, and .38 and .44 Specials come in. There's a difference.

To the reloader nearly all things are possible and the .38-40 and .44-40 may be given even higher velocities than those secured by the use of standard factory loads. For such reloading the pistol smokeless powders are the best, but the reloader should, of course, be well experienced before attempting such work.

The .45 Colt, in smokeless loads, shoots pistol smokeless powder. Such loading is efficient, but I have always felt, when shooting such loads, that they are not as powerful as they might be. These smokeless .45 Colt cartridges fall so far short of equaling the much-discussed and rather mythical "terrific recoil of the .45" that one wonders if, after all, he is shooting a .45 Colt To a male child, just graduating from his Daisy Air Rifle, the kick may be terrific, but no really healthy, grown-up man should get nervous prostration after shooting even the much lamented .45-40-260 load.

The .38-40, .44-40 and .45 Colt are not target cartridges. For a few shots at target, for any number of shots at cans, bottles, and rocks, or during the peculiar tension of game shooting, the recoil of any of the Big Three is not noticeable; but, for a long string of shots at target, the incessant, almost rhythmic pounding of such shooting with these heavy charges unsteadies one's nerves.

With black powder loads, these three cartriges are about equally acurate, in well-chambered arms. Many of the older revolvers made for the .45 Colt were much too large in their chambers and barrels and could not, of course, shoot accurately. Now and then one finds a particularly accurate .45 Colt revolver made as long as forty years ago, but the general run of all revolvers for the .45 Colt cartridge are not as accurate as the general run of old revolvers chambered for the .38-40 and the .44-40. In a tightly chambered cylinder and a bullet-tight barrel, the .45 is the most accurate of the Big Three, when shooting black powder, because of its heavier bullet, cleaner burning load, and the long bearing of the bullet on the barrel.

When shooting smokeless powder loads, the .38-40 is very slightly the most accurate of these three, in the average run of revolvers. Potentially, the .45 Colt cartridge is again the most accurate of the Big Three, because of pistol smokeless powder and of the long, strong bearing of the bullet on the barrel. In tightly chambered and barreled revolvers, which are now being made more frequently,

the .45 Colt is the very most accurate of these three. The .38-40 and .44-40 are really quite accurate in standard smokeless loads because of the metal-cased bullets, which are always more accurate than cast bullets wherever the bearing of a bullet on a barrel is not particularly long or firm. The .38-40 is slightly—but very slightly—more accurate than the .44-40 because of the better shape of its bullet. The .38-40 and .44-40 should be still more accurate if they were loaded with pistol smokeless powders.

With any but the very best chambered and bored revolvers for these cartridges, the reloader can improve upon the factory loads by the use of pistol smokeless powder, full-sized bullets of hard, lead alloy, and cartridge cases expanded to fit the chambers. With the short bullets of the .38-40 and .44-40, one can even use a bullet that is slightly oversize, although to do so with the longer and heavier revolver bullets, like the .38 and .44 S. & W. Spl. and the .45 Colt, would very likely burst the barrel. In barrels of much greater diameter than standard, cast bullets will give superior accuracy because they, unlike the metal-cased bullets, can expand, or upset, until the bullets fit the barrel very tightly.

I have written of accuracy rather indefinitely, which may be a little confusing. The .45 Colt will not shoot as accurately as the .38 S. & W. Spl.; nor do I believe that it ever can be made to do so in anything like its present form. The smokeless powder loads for the .45 Colt will, however, shoot so very accurately in the latest and best made revolvers that the advantage of its larger bullet, when counting the scores on a target, will fully offset its slight inferiority to a .38 S. & W. Spl. in the matter of accuracy. Report and recoil of the .45 Colt are its greatest disadvantages for target shooting.

When shooting at game, tin cans, and the many objects which serve as impromptu targets for the man who shoots, the flatter trajectories of the .38-40 and .44-40 will make these cartridges the superior of the .38 S. & W. Spl. in accuracy, with its steeper trajectory. On targets the .38 S. & W. Spl will sometimes better a score made by the .38-40 or .44-40 a full five points in every 100 possible points.

The trajectories of the Big Three vary considerably. The .45 Colt has a slow traveling bullet and a resulting steep trajectory, although the .44 S. & W. Russian and Special, and many others, have even steeper trajectories. When shooting at large or small objects, at rather short distances, this matter of trajectory is of no consequence, but, when shooting at small game over the longer distances for which revolvers are suited, one will make quite a few misses because of the drop of the slow traveling bullet. It is seldom that one experiences such regrettable shooting because most game can be approached to within quite short distances, but, sooner or later, every outdoorsman feels the need of the very best trajectory possible in a revolver load. The .38-40 has the flattest trajectory of any standard revolver load and is, for this reason, one of the most popular heavy revolver cartridges among those who live constantly in the mountains, where distances are often difficult to estimate. It is, in fact, so nearly in the class of the .65 and 9 mm. Lugers and the .38 Auto. Colt regarding trajectory that, at all practical distances, there is scarcely a discernible difference. The .44-40, although a little slower than the .38-40. has a trajectory that is still superior to the great majority of revolver cartridges.

In reloading, the .45 Colt is the best of the Big Three. The pressures developed during firing are so low that, with the straight-sided shells of the .45 Colt, resizing is never necessary. Most of these shells may be fired, without resizing, until the primer pockets are worn too large to hold primers and the mouths of the shells are frayed and split from often repeated crimping and expanding. Or one can, instead of crimping the shells onto the bullets, size the mouths of the shells (an easy task) so that the bullets may be held friction tight. The straight-sided .45 Colt shells will withstand much of this treatment without crumpling under the force exerted while seating the bullets.

The .38-40 cartridge cases must usually be resized after every fourth reloading and the .44-40 cases after every fifth, in the Single Action Colt. In the Colt New Service more frequent resizing is ordinarily necessary to permit simultaneous ejection. I have noticed, too, that quite often the rear ends of the chambers in New Service revolvers are finished larger than those of the Single Action, in the .38-40 and .44-40, allowing more swelling of the cases.

Crumpled cases are common occurrences in reloading the .38-40 and .44-40. The double curvature of the sides of these cases cannot withstand the end pressures exerted while seating bullets friction tight or with a heavy crimp, except when the shells are still very new and strong. There is also a considerable amount of difficulty in keeping the bullets from being pushed back into fired shells when they are reloaded with dense powders. The usual .38-40 and .44-40 cast bullets have no crimping grooves to prevent this and one can escape this trouble only be constant neck sizing or by the use of a shell indentor. The necks of most fired .38-40's and .44-40's are larger at the rear than at the mouth and most reloading tools for these cartridges do not properly reshape this part of the shell without the use of a neck-sizing die.

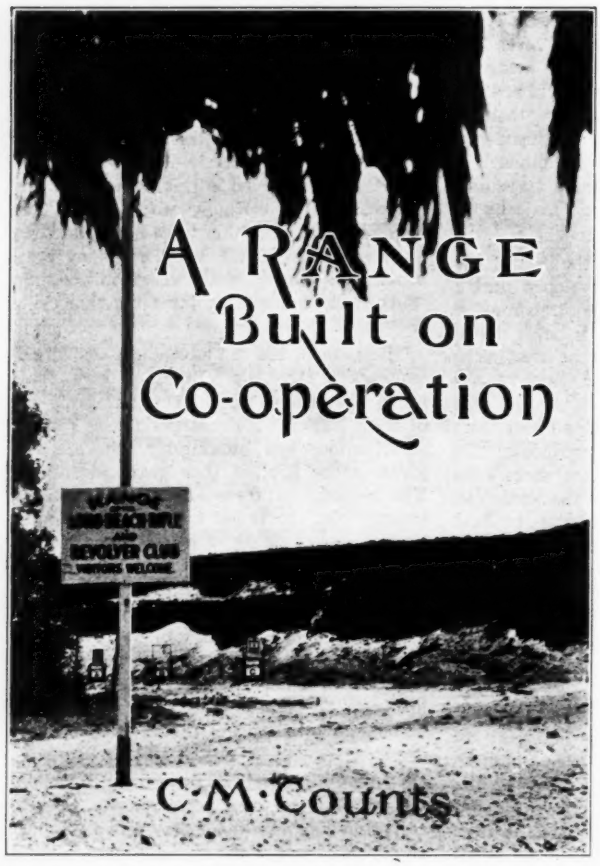
Most of our revolver cartridges could be reloaded to give materially increased velocities. That our factory loaded cartriges are not so made is because of the existence of many old revolvers, in poor condition, and which are made of metals inferior to those now available to firearms manufacturers. Such accelerated velocities are possible only for the reloader. The .38-40, .44-40, and .45 Colt can be improved in this respect, and any improvement is certainly worth while, but, because of the very thin walls necessitated by the large shells of the Big Three, any great increase of velocity would result in pressures which could quite easily burst the thin cylinder walls.

These, then, are the advantages and disadvantages of the Big Three; at least those which have shown themselves during my use of them. Their disadvantages are, as may be seen, serious and unmitigable, but are forgiven in the light of their great advantages. The greatest of these advantages is killing power. Not the rather uncertain and limited killing power of the 9 mm. Luger and .38 Auto. Colt, which is effective only in certain rare uses and is mediocre in all others, but the most overwhelming, smashing, rending, obliterating power which can now be loosed from side arms using standard ammunition; a power of a sort which is effective against any man or beast towards which man dares point a revolver and press the trigger.

The second greatest advantage is the sufficient and practical accuracy which enables one to place the great power of any of these cartridges into the spot most desired. Target cartridges these are not, although the .45 Colt, in recently made arms and in certain older ones, has an accuracy which makes it a wonderfully effective game and defense cartridge for all moderate distances. The .38-40 and .44-40, with trajectories compensating their slight inferiority in accuracy, have that, for revolvers, extended range which makes of them our most effective game and defense cartridges for any shooting into which distance enters.

The wide-spread and plentiful distribution of these cartridges is an asset which may well be classed as a part of the dependability of the arms shooting them for, without ammunition, even that most dependable of all arms, the muzzle-loading cannon, is a foolish and worthless mass of heavy metal.

There are other advantages, perhaps many which my experiences have not yet taught me, but these are the greatest. When red blood spurts madly through dilated arteries and the whole system is tingling with excitement of one of the great moments which only the wilderness affords, when the cheek of deepest tan and of healthiest contour turns pallid and drawn and the heart feels weighted and crushed by the icy hand of a great dread, all that counts is a bullet that strikes a withering blow, a gun and a cartridge which direct that bullet as unswervingly as the vengeance of the gods, and a supply of ammunition which can last until one's game is secured, or, in danger, until the last adversary is mute and lifeless—or else, when the odds are too great, one lays himself down for the last long sleep.



FLAT broke, with a handful of members and no target range, was the hopeless situation that faced the Long Beach Rifle and Revolver Club sixty days ago.

A few of the faithful were carrying the load, for a real "rifle bug" does not know what it means to quit. The same kind of fighting spirit has built trans-continental railways, settled vast empires and whipped several foreign nations, according to some of our best histories. It also built a small bore target range, second to none in Southern California.

Locations for target ranges in Southern California are as scarce as pre-Volstead liquor. Pick out a site and the following day you are likely to find a real estate sub-divider serving hot dogs on your firing point to a mob fighting for lots around your targets. Location was the first obstacle.

The vicinity of Los Cerritos, one of the best residential sections of Long Beach offered the one solution. The Los Angeles River at this point being dry, skirts bluffs about seventy feet high. These offer perfect protection for targets. The river bed is covered with a liberal growth of "bosque," interlaced with drooping vines and bordered with a veritable bower of pink mountain roses. It is indeed a regular mountain setting and only fifteen minutes from the heart of Long Beach. A clearing offered a natural location for the range.

The owner was appealed to, the situation fully explained and the result was a five year lease at the munificent sum of one dollar a year. This through the kindness and generosity of Mrs. Amelia M. E. Bixby, one of the wealthiest and most philanthropic woman of California.

Now if you want to get something done at the least possible cost, line up a few policemen on your side. Captain J. B. Worley of the Long Beach Police Department, a raving maniac on the subject of firearms, was next broached to the effect that crime detection had to cease until Long Beach had a rifle range. This range was to be for the joint use of the Police Department, and the taxpayer was promised the unique sight of seing a policeman that could use something besides a club.

Worley is a hard man to stop, must be because he has red hair, for the next Sunday that rifle club had a day of labor. A gang of prisoners from the city jail welcomed the chance to take the air, and set the pace. Doctors, lawyers, policemen, and others worked side by side with those jail birds, and it was a real outing. Digging post holes, stringing barb wire, building a real camp kitchen, and erecting target butts, to say nothing of the erection of six frames for the pistol cranks, were a few of the small jobs completed. This was repeated for several Saturdays and Sundays until we finally viewed the finished product.

Ample facilities are now provided for firing each range from 50 to 200 yards simultaneously. Targets will accommodate twenty contestants from the same firing point. The revolver range is so situated that it does not interfere with the rifle range. Matches can be held on each at the same time. The location also offers ample opportunity for further enlargement should necessity require.

The expense was borne by donations. Detective Le Barron was able to induce the city to donate a few buckets of paint, as well as tools for the work. Lumber was donated, borrowed and some bought. Take it all in all, that range was completed, not by the use of dollars, but by the hearty cooperation of a small group of men who realize the benefits to be derived from intensive rifle shooting. Benefits inuring not only to the individual, but to our government and local community as well.

One of the most attractive features of the range is the kitchen adjoining the firing point. Here the women members of the club prepare lunch that will suit the most exacting. Tables and benches in perpetual shade provide a place to rest during the noon hour and post mortems are in order to explain that "miss."

The women are just as enthusiastic as the men and are also on a par with them in ability. Possibles are of frequent occurrence with some of the members of this team.

The range will receive its first real baptizm of fire on the 15th and 16th of August. At that time the club will hold a "Little Camp Perry" shoot under the auspices of the Western States Small Bore Association. A live wire committee, headed by Captain Worley, has already secured from local merchants nineteen beautiful cups as trophies. This will allow cups for first, second and third place in four men's matches, one women's match and one revolver match. In addition a beautiful cup is also offered for the grand aggregate score in the four men's matches.

Invitations will be sent to all clubs in California, but this (*Concluded on page24*)

Illustration below shows firing line of the Long Beach Club, which we must admit is fixed up somewhat out of the ordinary. The title cut shows the club signboard and we call particular attention to the last line thereon.

Killing Power

By Chauncey Thomas

"THE less the velocity the greater the killing power per foot-pound of bullet.—C. T." I published that line years ago. It was true then, it is true now, and must always be true. To kill all bullets must of course penetrate, and as every vice is only a virtue carried to to one of that virtue's two extremes, the amount of penetration necessary depends solely on the object hit. At first glance one would perhaps think that a common hurled stone, such as is said to have put Goliath to sleep per David, is zero penetration, but even a stone that does not break the hide must have some penetration or it cannot set up the internal waves of force that cause its usually stunning effect. On the other hand, the needle like penetration of a comparatively narrow fast body that goes through the object hit and exhausts its power farther on, that is obviously too much penetration. With the same missive this would be true, a waste, on a jackrabbit at 1,000 yards and in some cases about right on a elephant's forehead at 10 yards. Penetration depends on the target just as much as it does on the bullet, as penetration is the reaction of each on the other.

Killing power can be divided into three more or less three distinct parts—hitting the object, for a miss is harmless—the sum total of the various characteristics of the bullet at the time it hits the object—and the composition of the object hit. Hence there is no such thing possible as one bullet, or one kind of bullet, being a better killer in itself than any other kind of bullet.

Muzzle velocity is of no importance in itself, because nothing is shot at that distance. The average time of the bullet's flight concerns only the accuracy of the bullet, and here by accuracy is meant not only grouping power, but that combination of characteristic that combined puts the greatest proportion of shots on the object aimed at under all unavoidable conditions, such as uncertain distance, wind, etc. A Schuetzen .32-40 lead-bullet rifle will outgroup a Krag rifle or Krag load in a calm day, but for the total accuracy the Krag, due to its lower trajectory, better wind fighting power, etc., is in the sum total the more accurate rifle, load, and bullet. It hits more.

Thus we can eliminate such items as muzzle velocity, trajectory, time of flight from gun to target from the killing power of a bullet, and will consider from here on the bullet just as it is about to touch the object struck. At that point accuracy ceases and killing power begins. When the object is hit the accuracy is thereby 100 per cent no matter what the former qualities of the gun and the bullet were before the bullet hit the object. But till the bullet does hit the object the killing power of all bullets is zero. Killing power begins where accuracy ends.

Now take any bullet—"X"—just touching the first contact surface of the target. Let us consider this alone, as every other previous element has now become of no use.

If the speed of the bullet "X" is comparatively slow, its caliber and weight is comparatively large, like a stone, and it hits the skull, the penetration is slight but existing, it even rebounds from the target, but if that target is a skull, it may fracture the skull, and produce instant death, through brain rupture, caused by the changed shape of the brain box. If the blow is on the living belly, the bullet rebounds, and the animal is not permanently injured, perhaps hardly inconvenienced. Thus a baseball on the catcher's tempie is fatal, on his two palms it is a pleasure. It is the same bullet—for a baseball or a railroad train is only a bullet—the difference in effect on the target is not in the bullet itself, therefore, but the difference is in the target. The target, strictly speaking is not the whole animal, but only that part of the animal effected by the bullet directly.

Now what causes this effect, or effects? Two things—rupture directly by the bullet, as by a knife, and—waves. Shoot a horse through the nap of the neck, as wild horses were occasionally creased on the frontier, and you have stunned him, but otherwise not hurt him at all. Just a small bite of meat and skin out of the neck. If you have hit the bone you have killed him. The bullet did not touch the spinal cord, nor the brain at all, but certain waves set up by that bullet did reach the nervous system of the horse, and stunned him. The knife-like effect of this bullet is almost zero, but the wave effect was 100 per cent, for the purposes intended.

Now if the bullet had touched that horse on the throat just right, with his head twisted just right, the knife-like effect of the bullet would have been 100 per cent, and the wave effect about zero, for his juglar vein would have been cut and he would have dropped almost as quickly, from blood-starvation of the brain, as from the stunning of the spinal cord. Now here we have two exactly opposite effects from the same bullet, but each effect resulting in the same end—the almost instantly killing of the wild horse. In the spinal cord result penetration was nearly zero, wave effect was nearly 100 per cent, on the other hand, in the vein hit, the wave effect was zero and the penetration, or knife-like effect was nearly 100 per cent.

There is nothing more mysterious about death than there is about the stopping of a clock. They are the same thing. The body, be it animal or plant, or behind that the proto plastic cell from which both animal and plant is made by various combinations of the same kind of protoplastic cells—is a machine like the clock is a machine. Stop that machine, that is death. "Recalled from Death" or "Brought to Life" as the headlines have it occasionally, is merely starting up a stopped but uninjured machine. Just like stopping and starting a Ford.

Now the animal may be compared to a railroad The nervous system is the telegraphic system of the railroad, along which go the orders of the train dispatcher, wires to the wrecking crew, the track fixers, etc. The paunch is the round house, where things are renewed. The heart if nothing but a pump, and that pumps oil for the various engines through pipe lines called arteries and veins. The bones are the bridges, roadbed, etc., the firm bases on which the more moveable parts of the railroad work. Put an oil burning railroad in a leather bag and you have an animal, including a man or woman.

Now if you would put the whole road out of operation at once just what would you do? The quickest way presumably would be to blow up the headquarters of the road, then no train would move, and in due time the roadbed itself would wash away and the bridges become broken and weather worn. Cut all the wires out of headquarters, and that is cutting the spinal cord in the neck. The road cannot operate, the road comes to a stop, and with it headquarters naturally disbands, goes to pieces—the whole road is dead, or stopped.

Break the pumping station (heart) or break open the first large pipe lines, and headquarters runs out of oil (power) with which to create messages to send over the wire, and the road stops. With this illustration one can readily invent various ways to stop the railroad, or the animal machine.

Now we have at times turned off a faucet too quickly and have heard and felt the whole plumbling shake and perhaps even a pipe break. Hit an animal pipe just right—vein or artery—and that same hydraulic jar goes through the pipes and breaks the main pump, (heart) and can even break a pipe in headquarters, the brain. Thus a shot through a large vein just right may rupture from purely hydraulic pressure a pipe (vein) in the brain, that brain rupture in turn prevents message of movement to the heart, and that stoppage of the heart reacts on the whole brain this time, and stops, by blood starvation, the whole brain, and the animal is dead. Veins have small stopcocks at intervals, of course, but a hydraulic pressure wave from a bullet can readily break all of them between the bullet and the brain, several feet away. They are not designed to withstand so much sudden back pressure of a fluid we call blood.

That is why some heart shots are instantly fatal, some are not. If the heart is full of blood, it explodes perhaps, and the bloodwave at the same time ruptures things in the brain. If the heart is empty, no liquid in it, hard as the fist, the bullet merely cuts a hole through

it, and the animal just bleeds to death. The fluid may collect between the heart and the heart-sack, and stop the heart almost instantly, or the sack may be so torn that the animal just bleeds from the heart, hence lives for some time, where if the ball had hit the heart about one second sooner or later, the heart would have exploded and the animal would have died on its feet. Herein of course I am deliberately avoiding all medical jawbreakers, and am trying to write plain United States as simply and clearly as I can.

Killing power from this angle can be divided into two elements, each re-acting necessarily on the other. That is, the structure of the target, and the structure of the bullet. The force of the bullet we are thinking of is a constant—"Y" and that force is expressed in foot-pounds. The bullet may weigh a pound, or it may weigh a grain, and have the same foot-poundage, that all depends on the velocity, of course.

What we now have to deal with is a certain amount of force acting on the target, and with that force we wish to do not only certain amount but a certain kind of work—and the final result of that work will result in the death of a living target, or perhaps in the excavation of the side of a ship, or a hole in a fort. But in this article we will deal only with living flesh, and touch on other kinds of targets only as bearing indirectly on the living targets.

Like shooting through steel is only a vague hint of the killing power on living matter, and a bullet that will kill a certain animal dead almost instantly may not penetrate half as much steel as a bullet that will only moderately wound that same animal, and from which wound it will readily recover. Thus a penetration of one-half inch steel may only moderately wound, and not kill an animal (recovery in a short time by the animal) when a bullet that will not penetrate half that thickness of steel—one-fourth inch—may kill that same animal instantly, each bullet to hit the same place on the animal, of course. As an example, to go to extremes for clearness of illustration, the armor piercing steel cores in the .30 caliber army rifles compared to the 500 gr. 50 caliber lead bullets that downed the buffalo—in Texas, mostly. The northern Buffalo Sharps was of course the .45-120-550 The "Texas Fifty" was the buffalo rifle of the Texas plains. Neither would go through a stove lid, each would kill a buffalo bull 400 yards away, one shot.

Incidently, when I herein speak of life and death, I have nothing whatever to do with the various religious, sentimental, emotional, and philisophical aspects of those two terms. We see a machine composed of lime, glue and water mostly, flavored with a few other elements like iron for example, and that machine is in motion that we call, herein at least, life. When that machine ceases to function we call that stoppage death. In this limited sense only do I use the two words, life and death, herein.

An animal, therefore, men and women included with rattlesnakes and moose, for our purpose of the study of killing (that is, machinery-stopping) power of bullets is composed largely of calcimine. The same old country whitewash we put on the henhouse—lime, glue and water, colored with iron rust to a red in some part. Take the calcimine out of a man-lime, glue and water—and you can put the rest of him in a cigar box for a coffin.

Now let us see how the force in the bullet affects these three items—lime, glue and water If the lime and glue are minus most of their water it is a bone, and the bullet of course breaks it. But except the spine and skull, breaking a bone does not kill. By kill of course I mean within a reasonable time for the hunter's purposes. If we let the water out of the machine we call an animal it dies, and that is bleeding to death. If quick enough to suit the hunter, that can reasonably be said to be a killing-power of the bullet. If the animal dies tomorrow that bullet lacks killing power, as we mean it here.

Now there is one thing left, the nerves and brain. Practically all fatal shots with immediate results are brain shots, and most of such hits are indirect. We hit a pipe in the chest, the water leaks out of the brain, the brain stops, the animal dies. Not of the chest shot directly, but indirectly. The direct cause of its death was leakage of the brain because of busted plumbing somewhere between the ears and the tail. We have seen how a pipe-hit can thus kill—by brain rupture or brain leaking—even if that pipe is several feet from the brain. Also how breaking the telephone wires in the body certain parts of the machine stop from lack of brain orders, and this stoppage, stops the whole railroad. Like stoppage of one engine can tie up the whole mainline.

But certain shots, particularly the high velocity ones with baby bullets, seem to give a tremendous shock, as the sportsmen say.

From a purely machinery standpoint how does this happen? The deadlier in many cases, slow heavy big caliber bullet does not give this shock. Great mystery, of course. But suppose the engine busts its boiler. That explosion was caused by suddenly released gas called steam. Now when the fast little ball hits water fast enough the force in that ball turns to heat, that heat make the water around it into steam, and does it mighty fast, too. If the bullet is going 2,500 ft. sec. when it hit and it penetrates six inches, and "explodes" which no bullet of metal ever yet did, by the way, that 2,500 ft. sec. trip is stopped in half a foot, or in just one five-thousandth of a second. Steam in a boiler at a pressure of 200 pounds to the square inch goes out a pipe about 2,000 ft. sec. So we may perhaps guess that this suddenly made steam around the bullet, back in all directions like a ball, more or less, with the pressure less and less as we get farther and farther from the stopping bullet, this steam-boiler pressure is perhaps about 500 pounds to the square inch, at least next to the bullet.

The force has now left the bullet entirely the force entered the water, and turned the ball of water around the bullet into steam, and that ball of steam at a pressure of about 300 to 500 pounds per square inch proceeds to explode just like any other engine boiler. We see the same thing in the air when we hit a can of tomatoes with a high power rifle. Not a drop hits the ground, it all turns to steam.

But the can of tomatoes does make much of an explosion in the air simply because it is not confined very much. The tin can is the boiler, and is easily ripped open, especially as the heat softens the solder that holds the can together till it gives almost like mush.

We can now forget the little lead pill, it's work was done when it made that steam ball in the animal. Let us now trace the steam ball. If it is in the paunch it fills the paunch cavity with steam, and this causes at least two deadly effects on the machine called the animal. The walls of the paunch act like the exploding boiler and the animal is gutted, which in turn drains the brain and the plumbing, and the whole machine stops from lack of brain orders. Or the walls of the paunch hold, then the steam causes pressures on all the plumbing in the paunch, where most of the blood of any animal is all the time, by the way, and that presure sets up a hydaulic pressure in the brain and spinal cord, breaks some pipes in those two places, and we again have the indirect brain-spinal-cord results.

If the steam ball is in the hip, it simply blows out to the surface, and does not make a today—kill wound, unless by chance it should break a large pipe so that the brain is soon drained by the leakage we have seen, that we call bleeding to death. In the war the doctors learned to cut out about a four inch path around the course of a high speed bullet, because the tissues were pulped, so they termed it. We might as well call it cooked, steam cooked, for that is what it largely is.

But suppose the bullet, because of not enough speed, and this lack of speed due in turn to longer range or too little muzzle velocity, or too much loss of air resistance, suppose this bullet has not quite enough force in it to make steam. Suppose it merely heats the water of the meat around it to near but not quite beyond boiling point? Then the bullet gives little shock. It's effect is largely local, akin to the cutting power of the bullet on the wild horse's neck pipes. That is when our fast pills fail us and we look dazed and should be arrested for what we are at least thinking. Some vulgar ones say it out loud.

Now turn back to the slow heavy large bore bullets. They too give shock. But how? By waves. The little bullet is like spanking the Pacific on the Japanese coast with a shingle, the waves set up are fast but small. Put that same shingle down into the water and sweep it slowly back and forth. The waves are bigger and slower and will go farther away than will the same single when it merely spanks the water. Now lift and lower the whole island say 10 feet, and that big slow billow will cross the Pacific and break on Oregon, thousands of miles away. This is the law of waves, at least one of them. There are many, by the way, and the law of ripples is something else again. (*Concluded on page 25*)

A Poor Man's Big Game Hunt in Alaska

By Karl Kepp

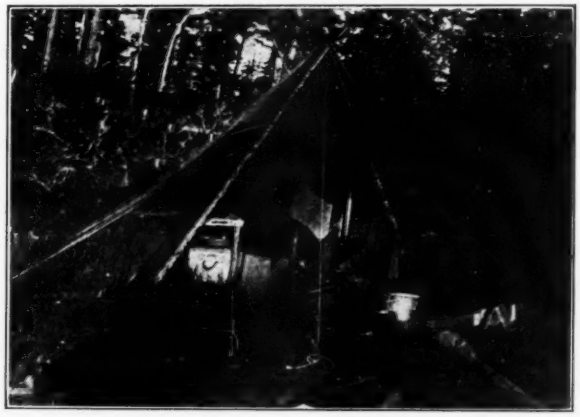
Part II

ONE evening coming home through the gathering dusk, I shot a tough old eagle who insisted on hanging by his claws to a limb of the tree. As I was waiting for him to fall I heard a stick crack in the wood near the edge of the beach. Expecting that it was a deer I stepped through the bordering bushes into the woods, which were comparatively open at this place. One hundred feet away on a small bank I saw the dim outline of a bear facing me. I threw the eagle gun to my shoulder and with some difficulty was able to see the bear through the scope. As the cross hairs were not visible against the dark background I centered the bear's head as best I could and pulled the trigger. He fell down and rolled toward the beach. I stepped out so that I could shoot again when he came through the brushes, but instead of coming he just thrashed around in the brush. I stepped back into the woods to see what he was doing and saw him walking from me. Afraid that he would get away I ran after him and when I caught up he was standing still with his head down. I was to the right of him and about 25 feet away. As the telescope was useless in the dusk at that short range I shot from the hip and knocked the bear over for good.

When I skinned him the next morning I found that the first shot, which was a Service bullet with a drilled point, had hit him in the lower jaw, tearing out a piece of bone about one by two inches. The bullet flew into small pieces like birdshot and scattered through the bear's throat almost reaching the chest cavity. This shot killed the bear by cutting his jugular and windpipe. The second shot was a Western 180 grain bullet and did very little damage. It hit him in the fleshy part of the shoulder and penetrated about three inches, not reaching the bone. All I could find of the bullet was a strip of copper which was about half of the jacket.

The conclusion one could draw from this is that the drilled Service bullet is a good killer and the Western 180 grain bullet is useless. I concluded nothing of the sort but put both shots down as exceptions to the rule. I later tried both bullets on deer and found that the Western bullet in a deer's neck will almost, if not quite, cut his head off. At about 300 yards I shot a buck with the drilled Service bullet. I registered five hits before the deer stopped going. One shot hit him in the side over the heart but only tore the skin, the bullet either exploding or glancing off. Three shots were leg shots, the final one being behind the ear. The bullet explodes too quickly and does not penetrate enough. We used these bullets especially for eagles and found them the proper thing, as an eagle will hardly ever come down unless he is almost torn to pieces. The only reason I shot the bear with this bullet was that it was in the barrel ready for eagles. I did not change the 180 grain bullets which were in the magazine for fear the working of the bolt would frighten the bear.

There has been much written about the ferocity of bears, especially the grizzly and his brother the Alaskan brown bear but our experiences had been different than that related by some hunters. They are most of them very wild and did not have the least notion of attacking us. Joe believes that most of the stories of bear attackng men are only partly true, that the bears were really trying to get away and just happened to run at the hunter instead of in some other direction.



A Camp Like This Is Easy to Move

He made one statement that seemed to me rather unusual. He said that never had a bear of any kind (and he had shot numbers of all the species in America) shown the least inclination to attack him. Not only that, but he had never met a man who had been attacked by a bear. So convincing did he sound that I began to believe that the bears' ferocity was greatly exaggerated. This notion led me into an adventure with a bear which gave me quite a thrill.

It was early in August, and Joe and I went up a stream to fish. That is, I carried a fish pole and Joe came along with a rifle to shoot the eagles which were along the stream eating salmon. I was about half a mile ahead of Joe, fishing a likely trout pool, when I saw a brown bear up stream coming down on the opposite shore. The bear was evidently after salmon; so, thinking that I would see how a bear fishes, I laid down on a sandbar behind a small bunch of grass. When the bear was about a hundred yards away he waded into the stream and I thought the performance was to begin, but instead of stopping he crossed to my side of the stream and disappeared into the timber. As I could still hear him I laid still and in a moment the bear stepped out of the bushes onto my sandbar. He was only thirty feet away and walking toward me with his broad head swaying from side to side.

"If I don't move," thought I, "that bear will surely step on me." That would be no sport as I judged him to weigh about a thousand pounds. "If I only let him know I am here he will run away," was my next thought. With that I stood up and said, "Woof!"

Now why I said "Woof" instead of "Stop" I don't know, but perhaps I thought woof meant stop in bear language. The bear did not understand, for instead of stopping he bared his teeth and charged at me with a deep growl. My first thought was, "Oh, what a liar Joe is." My next was to reach for a club. That was all the thinking I could do before the bear stopped very suddenly five feet in front of me and then rushed away fully as fast as he had been charging me. About a hundred feet away he stopped and looked back. I was very nervous and said to him, "If you don't go away, Mr. Bear, I'll take a big gun and shoot you." He seemed offended at this because he turned and disappeared into the timber.

Now, you may not believe this. Joe didn't until I showed him the marks in the sand where I had laid down and where the bear had plowed up the gravel in stopping. The only way I can explain the bear's actions is that he thought I was another bear encroaching on his territory and he found out his mistake only when he was close enough to smell me.

The eagles began to get fewer as the summer advanced, most of them following the salmon up the streams. This is one of the reasons there is a bounty on the eagle, it being claimed that the eagles destroy the salmon and prevent them from spawning. How true this is I don't know, but we did find a good many fish in the eagles' nests and we have seen them dive down to the water and come up with a live fish in their claws. I am inclined to think however that the bears kill more salmon than the eagles. All along the salmon streams the bushes are trampled down where the bears have been walking and the ground is covered with half eaten fish. We also saw live salmon with big scratches in their backs where the bears have had hold of them. The eagles seemed to be after the salmon that the bears had left, and those that

had died after spawning, rather than those that were alive and had not yet spawned.

With a scarcity of eagles we moved camp rather often and before we hardly realized it we were at the mouth of Seymour Canal with the mainland only five or six miles away

Ptarmigan Shot After First Snowfall. Four Miles NE of Healy

across Stephens Passage. Still having plenty of provisions we ventured to row over and see what that part of the country looked like. We crossed in the night as the water was calmer then and there was not so much danger of being swamped by the waves coming aboard our heavily laden boat. It was about one o'clock when we reached the shore and started to look for a camp site. There seemed to be none around, the cliffs in most places rising directly from the water's edge to over a thousand feet high. Joe said there was a good spot to camp somewhere near because he had stopped there a week one winter to await the passing of a storm. We rowed until four o'clock that morning before we found Joe's camping place, so well was it hidden away. But after we found it, it proved to be nearly ideal; a good, smooth beach for the boat, plenty of wood, a nice level place for our shelter tent, and best of all a small, clear stream of water only ten feet from our tent.

That forenoon we slept, but in the afternoon we started after eagles. There was only one place where we found any and that was at the head of a bay about a mile from camp. The salmon were spawning in a small stream which emptied into the bay, and because of waterfalls, could only go up it about 300 yards. This short length of the stream was overflowing with salmon and the bears and eagles were reaping a rich harvest. When we shot at an eagle about twenty or thirty rose from the trees and went sailing away. They were so wild that hunting was poor, the only ones we could get being those that were so full of salmon that they couldn't fly far. This was the worst camp for eagles that we had yet struck but the trout fishing was fine.

While Bob and Joe were shooting eagles I sat down beside a small pool and almost as fast as I could pull them out caught ninety trout that were from eight inches to a foot long. It seemed impossible that there could be so many trout in such a small pool, but when I left it looked as if there were just as many swimming around as when I came. Above the falls, where there were no salmon, I could catch only an occasional trout, all of them being below the falls eating the salmon eggs as fast as they were spawned. We cleaned the fish that night and put them in the small creek by our tent, first carefully daming off a small pool for them.

The next morning we were all ready to eat about two dozen trout apiece, but when we were going to fry them we found every single fish gone. Not a fish or even a tail was left. How ninety dead trout could vanish so completely while we slept only twenty or thirty feet away was a great mystery to us. A bear would have made enough noise for us to hear, or at least disturbed the ground so we could tell he had been there, and we could think of no other animal large enough to carry off so many fish in one night. A mink might take a few, but he could not have taken them all. Joe finally said that it must have been a pair of otters as this was the only animal capable of playing such a trick on us and not leaving some signs. But there were plenty more trout where they came from and Bob and I soon had camp supplied.

We noticed that on the mainland there were no deer trails and when we questioned Joe he told us that the deer were to be found only on the islands. He said that there were so many wolves on the mainland that the deer stayed on the islands for protection. We also found that the only bears that were eating the salmon along our trout stream were black bears. Joe said that the black bears and the brown bears were deadly enemies and did not stay long in the same territory. The brown bears were to be found mostly on the islands while the black bears confined themselves to the mainland.

It was now getting near the middle of August and Bob and I were beginning to think about the second part of our trip to the Mt. McKinley region. We were all ready to go back to our main camp when a great windstorm came up throwing the waves high up on our beach and almost reaching our camp. This lasted for several days and we were beginning to think we were marooned for the fall when one morning the wind died down and by noon, with the change of tide, the water was calm enough for our row boat. We started out at twelve o'clock noon and as the water stayed calm, and a bright moon gave us light, we rowed all night, reaching our camp on Oliver Inlet in the afternoon of the second day. The next morning we took down our big tent and packing all of our things started off for Joe's cabin. Here we sorted over our equipment and sent home, or left with Joe, all the things we would not need on the rest of our trip.

It was about the 25th of August when we left Juneau on the boat for Seward. At Seward we took the train for Healy, arriving early in the morning when no one was up but the station agent.

As there was nothing else to do we started out on a trip of exploration, to the coal mine which our map showed as four miles up Healy River. At the mine we met a very pleasant young fellow who was up before breakfast working on an electric generator. He told us from his own experience that the hunting was good up Healy River or Moody Creek, a branch of Healy. He showed us on our maps what routes to follow and also told us about the cabins and other things to be found along the trail. This was valuable information and made us decide to set out that very day. We walked back to Healy and after breakfast sorted out our equipment and bought a supply of groceries. While we were making up our packs two government surveyors asked us where we were going and when we told them offered to carry our packs on a spare horse they had if we would delay our start until the next morning. We were very glad to do this, as we had a little over a hundred pounds in our packs. Our new friends, Sam White and Jim Carroll, were very pleasant young fellows and seemed very glad to help us out. We certainly were glad for their help because it is no child's play hiking over mountains and thru brush with a fifty pound pack.

The first stop was at a cabin which we reached in the middle of the afternoon. Big

Small but Satisfying

sheep horns hanging to the walls gave us a pleasant thrill of anticipation for the game to come. The second day we sighted our first sheep on the side of a hill abount a mile and a half away. I counted twenty-one in this bunch and could see with the glasses that

nearly half of them were lambs. We made our permanent camp that afternoon at the base of a six thousand foot, unnamed mountain which the surveyors expected to use as a signal peak. While washing the supper dishes we saw two caribou feeding on a slope of the mountain about a mile away. As I wanted a closer view I started out for the place where they were feeding. They were gone when I got there but in walking back to camp I saw a caribou about a half a mile away walking toward the path I must follow in getting to camp. I ran to where I expected the animal to cross my path and sat down. I had hardly seated myself before a big bull caribou walked over a ridge and stood looking at me. He seemed surprised and as I did not move he walked toward me with his massive head of horns held high in the air. He came so close I could see him blink his eyes. After regarding me for about two minutes he seemed satisfied and trotted away, stopping every now and then to look back. I had a gun in my hands all this while and could have killed him very easily, but Bob and I had decided we did not want caribou horns as they were too long and spread so wide that we would have no place to keep them if we did take a set with us.

The next day Jim and I spent looking for my rifle which had been lost from the pack, while Bob and Sam climbed the mountain to see if it was suitable for a signal peak. The day was a success, for I found my rifle and Sam said he could see all the other stations from the peak. But the day was not over yet. As we were eating supper a snow white cloud seemed to burst over a ridge and in a moment nineteen sheep were trotting along the hillside. Almost at once they started feeding. They alternately trotted a few paces and stopped to feed and, as they were coming toward camp, we finished our supper before starting after them. Directly after supper Sam and I, Jim and Bob magnanimously offering to wash the dishes, started for a ridge over which the sheep must come if they did not change direction. When we came to the top of the ridge we found the sheep feeding less than a hundred yards below us. Sam gave me the first shot. I took careful aim from a sitting position at a young ram and missed him completely. I was much surprised but did not let this delay me from further action. Standing up I brought down the sheep with the next shot. Sam began to shoot too and for a little while it sounded like a battle. Sam called enough when we had five sheep. The sheep were so confused that I believe we could have shot the entire flock if we had wanted to. As it was we had enough meat for our camp and for Sam and Jim to carry back to their main survey camp.

The next few days were spent in putting in the triangulation marks and building the signal on the peak. When this work was completed the surveyors started back for Healy. Jim, who was the packer, said that he expected to be back in a week with a signal tender and his outfit, and offered to bring us more grub. We accepted the offer and ordered a two weeks' supply. While waiting for Jim to come back Bob and I started to look the country over for a good sized sheep head but we had hunted only two days when the heel tendons of my feet became so sore and swollen that I had to stay in camp. My shoes, getting wet from crossing streams and walking in the snow on the peaks, had dried hard and out of shape. This made them bind in the back so as to pinch my heel. I ripped the seam with my knife but not before my feet were badly swollen.

The Type of Cabin Miners Build in the Interior of Alaska

Walking now being out of the question, we spent the next two weeks near camp shooting ptarmigan and ground squirrels. I used .32 Colt automatic pistol shells in a Marble's adapter for my Springfield and found them both accurate and powerful. Our grub was getting low as Jim did not return as he had expected. If we had not found a small sack of flour and some beans and bacon in an old cabin we would have been reduced to a strict meat diet.

One morning after breakfast, when my feet were practically well again, we saw a sheep standing on a high ridge about a mile away. Through the glass it looked like a big ram and off we went to stalk him. When we got to the top of the ridge we saw eight sheep, including two large rams, walking around the edge of a knoll about a quarter of a mile away. One of these must be the sheep we saw from camp. Backing down below the top of the ridge we began a detour to head them off but while running around the side of the knoll we frightened four or five caribou, who ran around after the sheep and started them trotting away. Sure that none of the band had seen us we started after them on the run, making sure there was always a ridge between us. After running about a mile we found ourselves above the sheep, who now had begun to feed again, walking instead of running. Ahead lay a ridge that they must cross unless they changed direction. A draw ran between this ridge and the next one and headed up where we were. Down the draw we went and stopped behind a bank to watch the ridge where we expected the sheep to come. No sheep came. We began to get impatient and started climbing the ridge, expecting any instant to see a ram looking over at us. We soon reached the top and, breaking over slowly, saw the sheep lying down less than fifty yards away. Bob and I quickly secured a ram apiece. The heads were by no means record breakers but they were large enough for us to feel very proud over.

After cleaning the heads and drying the skins we started back for Healy and reached there in two days. We found a letter waiting which told us that the survey party had changed its plans and was not to occupy the Healy station that year. This accounted for the non-appearance of Jim.

By the standards of some sportsmen our hunt was not a success because not one of our trophies was of record size; but to get record heads was not our ambition and, although we killed bear, deer, and sheep, and could have killed caribou, it was not what we killed that gave us pleasure as the pursuit of the game. We were more pleased with the game we could have killed and didn't than with what we actually shot. Because we were our own guides and did what we pleased without regard to any fixed schedule we had a much better time than the sportsman who must follow his guide and have his date of return constantly in mind. Our only worry was that our money might run short, but we did not let even this bother us much because we kept our return fare separate and pinned in our shirt pockets. When the rest of the money was gone we had only to go home.

It was fortunate for our finances that there were so many eagles on Admiralty Island, because they paid our expenses while we were in southeastern Alaska. They added two hundred dollars (not counting Joe's share) to our original amount, making our trip cost us just seven hundred and fifty dollars. This is a great contrast to what most of the outfitters in Alaska charge the hunter. J. A. McQuire in his book "In the Alaska-Yukon Gamelands" writes that for a forty-day hunt the average charge is twenty-five hundred dollars per man. At this rate our hunt would have cost us about $15,000. But let the outfitters charge what they please—Bob and I now have enough experience to go after big game without them. All we need is railroad fare and grub.

American Title Defenders Sail

By C. B. Lister

"WHERE are you going? When are you coming back? Take off your hats! *Take off your* hats! Give us a smile! A *smile!* That's it. Thank you."

The crowd below on the dock probably thought that some of our best known prima donnas were on "A" deck of the good ship "Republic" of the U. S. Lines sailing for a triumphant tour of Europe, from the manner in which the camera men gesticulated, cranked and shouted instructions. But the curious ones who climbed to the top deck of the ship found instead a bunch of bronzed, healthy looking males, stars indeed, but stars of the rifled tube and so far as is known, with none of the temperamental habits of the prima donnas of the stage and of some other branches of sport.

It was exactly noon, daylight saving time, on the 15th, that the United States International Free Rifle Team "shoved off" on their voyage to St. Gall, Switzerland, and if your local paper did not carry a picture of the squad, standing up, sitting down, waving their hats or shaking hands among the boat davits, funnels and ventilators of the "Republic," you want to ask the editor "How come?" because no group of athletes ever "stood for their picture" in more poses than did this bunch who are charged with the job of bringing back to the arid sands of Hoboken the title "Champions of the World." Now is the time to start the local paper thinking about this International Team. Things will be happening in the Swiss cantons in August. Dispatches will be turned over to the Press Associations and they will broadcast them. But newspapers only print what they think their readers are interested in. Better make it plain *now* that you want all the news you can get concerning the International Matches.

But to return to the Team. After the elimination at Quantico reported in the July 1st issue, the Team went into star chamber session and discovered ere long that they had been supplied with as good rifles and a little bit better ammunition than any previous team has had. Scores during the period of team practice averaged high with no apparent tendency to fluctuate wildly. Probably the most encouraging feature of the practice period was the work of Dodson. A newcomer in the International arena, this protege of the petite canon gives every promise of becoming a regular traveler in fast company. Major Boles, Captain of the squad, with malice aforethought, did everything that occurred to him as possible means of disturbing the cool control of the Pennsylvanian, but Dodson continued to make matters interesting for Fisher. The latter appears to have hit his stride after the customary period of mental depression when he fails to shoot new record scores in each day's preliminary practice.

The Team left Quantico on the 14th, spending the night at the Vanderbilt in New York. All hands were at the dock long before sailing time and baggage was stowed in the staterooms and the outfit gathered for the orgy of picture taking without anyone being misplaced in the subway, on the dock or aboard ship. A most remarkable feature of the smooth getaway was the fact that no one left his ticket at Quantico or packed it in the bottom of his trunk.

Acting on the assumption that carrying an umbrella is a sure way to prevent a rain, the Team carried in their baggage the Argentine Trophy. This trophy, emblematic of the Championship of the World, was first brought across the Atlantic to this country by the historic "pick up" team of 1921. It is the job of this year's Team to see that it does not become separated from their baggage by the Swiss this year.

There was one member of the Team and only one, who was not in the pink of condition when the "Republic" was taken in charge by a bunch of snorting, churning tugs and pushed out into the river. Major Julian Hatcher, Adjutant of the Team, had spent two weeks during the hottest spell of a Washington summer arranging for transportation, arranging for orders, arranging for reservations, arranging for passports, arranging to make the entry of the Team through the French and Swiss Customs as easy as possible, arranging for this and arranging for that, and to his credit be it said that the arrangements were all made. But no man can spend two weeks at hard physical and mental work in an atmosphere approximating a Turkish bath without losing weight and appetite. Adjutants of previous teams will add a fervent "Amen," but it is doubtful if any of them ever had quite such oppressively hot weather in which to get their teams under way as that in which Hatcher labored. As a result, when he joined the squad in the picture he was posing largely on his nerve. He was ready for a long rest in a steamer chair. But with the knowledge of a job well done, with nothing in particular to worry about for ten days, and with those ten days all spent in the bracing atmosphere of the North Atlantic, it is to be expected that he will be as physically fit as every other member of the squad by the time the Republic docks at Cherbourg.

The "Republic" is a big ship, but she is not a fast one, so that the team was not due to land at Cherbourg, France, until July 25th. They should have arrived at St. Gall, Switzerland, about the 27th or 28th, depending on how much trouble they had in getting their guns and ammunition through the customs. This will permit ample time for acclimation and preliminary practice.

The International Matches start August 7th, with the usual re-entry events, including the Ninth Individual Match with the Military Rifle, and the Master Rifleman event. The big International Team Match, the twenty-third competition under the International Shooting Union rules will be fired on August 13th. The scores made by members of the various teams in this team match are considered as the official scores in determining the individual champion in each position and the individual world's champion with the Free Rifle. This custom of combining individual and team event, while frowned upon in this country, is the ordinary method in Europe.

The Team this year faces a difficult mission. They must meet the Swiss, our most dangerous rivals, on a Swiss range surrounded by the Swiss populace. To the experienced members of the squad this will not mean much of a handicap. Boles, Fisher, Coulter, have "looked the enemy in the eye" before and half kidded, half shot him into submission. Morgan has tasted of the same experience in South America. But to Dodson, on whom much depends, to Phillips, to Meeds, and to some extent to Ioerger, veteran of National Matches though he is, the lack of friendly moral support is certain to be felt. It is the low man on a team who wins or loses matches. And from somewhere among these new men the fifth man on the 1925 Team must be picked. The Team, if it to hurdle all obstacles and defeat the Swiss once again in the long, gruelling match, must feel consciously the whole-hearted support of the American shooting public. It will mean points to the score. It will mean a won match or a lost championship.

Every member of the Association has been asked to contribute to the fund required to send this team abroad. The contributions may be One Dollar or One Hundred Dollars. To the men over there on the firing line it is the spirit of the giver and not the amount given that helps. If you have not sent your contribution, small or large, get it in. Get every man in your club to contribute. Direct invitations could not be sent all of them.

You might tell them the incident of the real American shooter in the Middle West. We have an idea, both from his letter and from the spirit manifest, that he is one of the old-timers. When he received the request for a contribution, cash was not so easy with him but he had a Government Liberty Bond. There was an American team going abroad to uphold America's title as Champions of the World with the Rifle. The team needed money, therefore, there was but one thing to be done. That was to get some money to them somehow. Our Mid-Western friend promptly went to his Liberty Bond and clipped the interest coupon which was about due. It amounted to $1.06 and was on its way to Washington as a contribution to help the 1925 International Team in the next mail. This is the spirit that has made the American rifleman of today the most-feared competitor in world competitions. It is the spirit which is par- (*Concluded on page 24*)

Cashing In on the Course

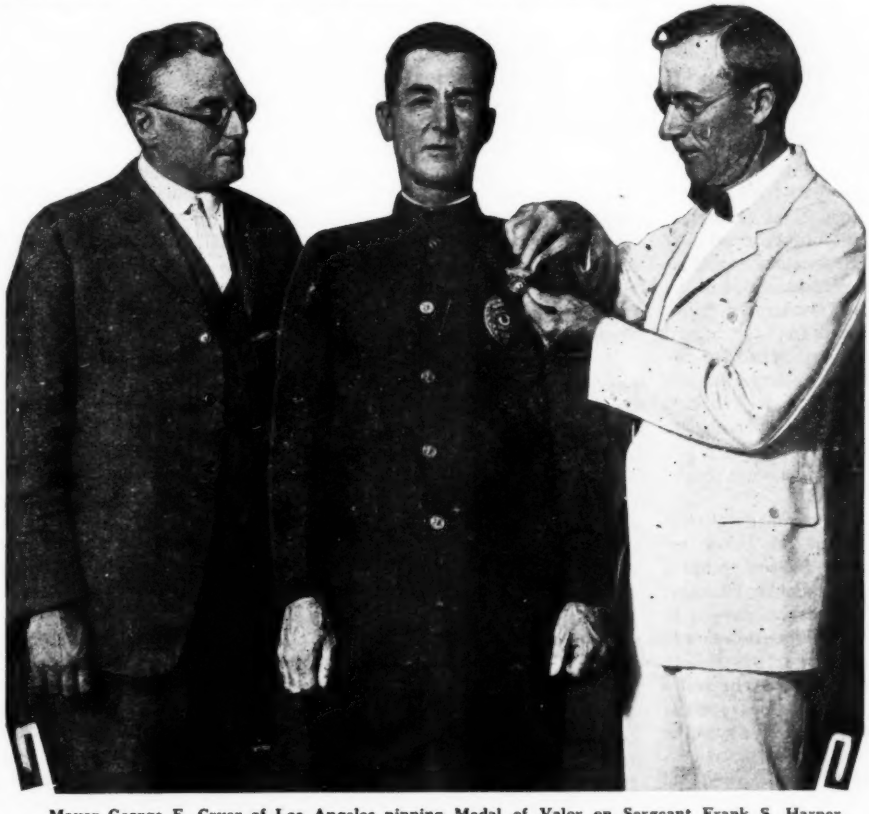
By R. S. Boyeson

THE entire Los Angeles Police Department took up compulsory training in revolver shooting, and many hundred members of the department joined the National Rifle Association. This story has been told before. However, the really interesting story is that which sets forth how the men who "took the course" put it to a very practical application and proceeded to shoot holes through some of the city's most energetic bad men.

The new Los Angeles police revolver range was started last February and within a few days after the opening ceremonies and several practice contests, some of the pupils were called upon to demonstrate what they had learned. It happened that there had been several drug store robberies in the month and that two men, whose descriptions had been obtained by the police, were very much sought by the Department. On the night of February 25th, the two suspects were followed when they made their way to the Blaine and Blaine Drug Company at 5220 South Main Street. They walked into the drug store, drew their guns and proceeded to go through their customary movements in obtaining the contents of the cash register. At this point police detectives who are members of the National Rifle Association, and who assiduously practice marksmanship, went into action. The bandits attempted to shoot their way out and were shot so full of holes that even the most skilful undertaker found it impossible to make them look presentable for burial. The "gunners" who trailed the bandits and then saved the state the expense of a criminal trial, were Detective Lieutenants F. H. Post, Walter E. Evans, T. D. Robinson and F. H. Cullen. It is generally admitted that Post and Evans each made a perfect score on their men while Robinson and Cullen acted as reserves and were prepared to lay a barrage at the back door of the drug store. Thus it happens that Chief of Police R. Lee Heath felt highly pleased to find that the small amount of money expended in improving the marksmanship of his men so quickly brought in excellent returns.

During the next month there were several brief encounters between Los Angeles policemen and boy bandits. On every occasion the police quickly won so impressive a victory that the news spread through the underworld and caused several undesirable citizens to make plans for spending their summer elsewhere. One of the marksmen of the range shot the tires off a speeding car that carried some youthful automobile thieves, and his accurate shooting prevented any bloodshed for the youths promptly put up their hands. The investment made was certainly paying good dividends.

A few weeks later a local bootlegger became very indignant at the persistance shown by the police in following his trail. He already had been fined twice and sent to jail once and so he naturally felt that it was necessary to adopt drastic measures to protect his business. Soon he let it be known that he had imported two notorious gunmen from the East and had given them orders to "blow the can off any cop who came nosing round." Chief Heath heard of this order and promptly consulted Inspector of Detectives J. E. Davis, who commands the Vice Squad. Davis is one of the good shots of the Police Department and is drawing extra pay as a sharpshooter. A few members of the Vice Squad who persistently had made high scores on the police revolver range, were sent into action and they suddenly appeared at the headquarters of the aforementioned bootlegger and made it evident they were eager for an opportunity to show their skill. The imported gun men "quit cold," and with their employer went peacefully to the jail.



Mayor George E. Cryer of Los Angeles pinning Medal of Valor on Sergeant Frank S. Harper, N. R. A. member, who gave a very practical demonstration of shooting ability in putting four out of five shots into a bandit who previously had wounded the policeman. Chief of Police R. Lee Heath is seen telling the mayor how it happened.

One of the most pleasing and impressive incidents connected with the marksmanship prowess of Los Angeles policemen occurred early in the morning of June 7th, 1925. This case attracted widespread attention, and won a medal for police Sergt. Frank S. Harper of Central Division. A brief outline of what happened follows:

A group of highly skilled bandits had committed several highway robberies in the residential sections and one or two burglaries. The police had a fairly good description of the men but were unable to catch up with them, due to the ability these criminals showed in covering their tracks and changing their method of operation. However, in one robbery the license number of the automobile used was observed by a citizen, and all members of the Police Department were instructed to watch for this car.

Shortly after three o'clock on the morning of June 7th, Sergt. Frank S. Harper reported off duty and started to drive home. As he passed by a local parking station he observed an empty Willys Knight sedan, bearing the license number reported used on the bandit car. This car had previously been stolen from a prominent citizen. The sergeant telephoned to Detective Headquarters and asked that men be sent out to watch the ma-

chine, and in the meantime he drove up and parked his car in back of the one under surveillance. Within a couple of minutes a taxicab drove up and a prosperous looking citizen got out and walked towards the vacant automobile. Sergt. Harper did not dare open fire on a mere suspicion, and it was necessary for him to interrogate the man. He walked forward and told the stranger not to touch the machine, at the same time asking him to give an account of himself. The suspect, under the circumstances, had a great advantage over the officer, and while apparently starting to explain his presence, suddenly snaped a revolver from a shoulder holster and shot his interrogator through the shoulder. Sergt. Harper was knocked off his feet but promptly opened fire. He had five cartridges in the cylinder of his revolver and he put four of them through the heart and lungs of the bandit and one through his hat.

When the detectives arrived a few minutes later, they found Harper weak from loss of blood, but in complete control of the situation. The bandit was thoroughly dead, but prior to his death had made considerable of a record for himself. He was identified in the Bureau of Records of the Los Angeles Police Department and was found to have served time in several penetentiaries and to be wanted in many parts of the country. Letters and papers found in his possession enabled the police to get quick action in rounding up his confederates and within a few hours five of the most desperate characters were locked in the city jail.

The fact that Sergt. Harper had taken a great interest in shooting at the police revolver range and had proven himself so apt a student, attracted almost as much attention as the courage and steadiness he showed in killing the bandit after being himself seriously wounded. As soon as this officer was able to leave the receiving Hospital he was the recipient of enthusiastic congratulations, official commendations and resolutions of sympathy passed by numerous civic and industrial organizations. It was suggested that he should receive a medal to commemorate his valiant conduct, and Chief of Police R. Lee Heath promptly designed an official Medal of Valor which will be awarded in the Los Angeles Police Department to officers who give proof of unusual courage and who risk their lives, against heavy odds, in performance of duty. A permanent die for this medal has been cast and after Mayor George E. Cryer and the Board of Police Commissioners made the formal award to Sergt. Harper on June 30th, there was much speculation in the Police Department as to how many medals would have to be issued each year.

Within a few days after Sergt. Harper returned to duty another incident occurred which showed the marksmanship ability of Los Angeles police officers. A person who was acting in a manner which aroused suspicion parked his automobile on a dark street in one of the ill-favored sections of the city. A young patrolman stepped out to question the suspect and the latter reached for a weapon. He never got that weapon, and it was fortunate that the officer had a humane disposition, otherwise he might have been shot thru the head instead of thru his "gun-arm."

Chief Heath and all of the division commanders now keep a very thorough check on the shooting ability of all members of the Department and each month they carefully study the scores made in the official qualification tests. They are greatly pleased when an officer makes a score of 280 or better, entitling him to an extra pay award of $5.00 a month, and they are even more pleased when an officer qualifies as a sharpshooter, with a score of 320 or better, entitling him to an extra pay award of $8.00 per month. They will be highly delighted when the Department has a large number of men drawing the $12.00 a month additional pay which goes to those who can shoot better than 360 out of a possible four hundred, over the regular N. R. A. course. Also it can be safely stated that their joy is unbounded when one of the diligent students of the "Police School of Marksmanship" goes forth and plugs a bandit or desperado. They look upon such action as the best possible proof that the citizens and taxpayers are getting full value for the money expended in training policemen to shoot accurately.

A live burglar or bandit brought into the police station and later held for trial will cost the state a vast amount of money. The sob sisters will break forth in the newspapers and all the silly sentimentalists will waste their time pointing to the fact that it will be a great sorrow to his poor old mother if he goes to the penetentiary or is hung. As a prominent editorial writer recently said, the presence of some sobby old women in a court room frequently causes a jury to acquit, or deal lightly with a desperado who may have brought widowhood to some woman or deprived some other mother of her son. The police find that it is not a paying investment to bring a bad man and gun-wielder into court. Even if they obtain a conviction, there is always the reasonable certainty that the convicted felon will be out again in a short time, doing business in the same old way. But it is quite different when an officer succeeds in shooting and killing a professional killer. There is no financial loss whatsoever to the taxpayers, and insurance companies are encouraged to lower their premiums on burglary policies. Also the undertakers are helped out a bit, and this deserving class of men should not be overlooked by the Chamber of Commerce.

Last month thirty-two members of the Los Angeles Police Department were drawing $8.00 per month additional pay as sharpshooters and thirty six were drawing $5.00 extra each month as marksmen. When the official tests are completed this month, it is expected that several men who are making unofficial averages of better than 360, will qualify as experts and draw $12.00 per month. At the same time there is every likelihood that before September there will be at least one hundred officially qualified sharpshooters and probably one hundred and fifty officially qualified marksmen in the Department.

Capt. Clyde I. Plummer, commanding the Lincoln Heights Division, has adopted an interesting and highly successful method in making his entire command proficient in the use of standard .45 caliber revolvers. He has a shooting range at the Lincoln Heights Police Station and he requires every officer serving under him to practice assiduously on that range. Also he divides his men into two equal teams, and has set an arbitrary scale of his own in scoring the shooters. His men shoot on a scale of 100, with each hit counting five points and twenty shots to be fired. Each miss costs the shooter five cents, and the money received goes into a fund which is kept to pay for a banquet to the winning team. At first there was a great deal of money in the treasury and the winning team could count upon a splendid banquet. But now things are vastly different. The winners would starve to death if they had to live on the banquet fund, and it is Capt. Plummer's hope that there will come a time when he can't collect a five cent piece.

Twelve divisions of the Los Angeles Police Department have revolver teams engaged in inter-departmental competitions and four divisions are engaged in contests with outside departments and American Legion organizations. A department team, of the five most consistent shooters, is in process of organization now, and next year Los Angeles intends to send a police pistol shooting team to Camp Perry, Ohio.

Recently Chief Heath issued an order instructing division commanders to test the marksmanship ability of each man in their division, to require all who fail to make a score of 280 or better out of a possible four hundred, to go to the police revolver range one day each week for special instruction until such a time as they can meet the test. In the meantime Capt. E. C. Crossman, National Rifle Association representative who started the propaganda and did the pioneer work in helping Chief Heath to get a revolver range, is getting a great deal of enjoyment in observing the marvelous success of his plans. Almost every man he meets in the Los Angeles Police Department has an N. R. A. button and an N. R. A. card, and many of the men feel that he is partly responsible for getting them more money on their pay checks each month. As for Chief Heath, he finds it difficult to refrain from calling out "I told you so," every time he meets any city official who at first was loth to "squander the taxpayer's money" in providing a revolver range and ammunition for police officers.

EDITOR'S NOTE: An increasing number of the larger cities throughout the United States are taking up the matter of training their police forces in the proper use of the weapons with which they are armed. THE AMERICAN RIFLEMAN will be glad indeed to hear from other municipalities as to the manner in which they are going about this necessary project and the measure of success which is attending their efforts. We hope to present a number of articles from various magazines on this subject in future issues.

Theories of Drift

By E. E. Dittbrenner

Second Paper

THE foregoing discussion of drift, while somewhat lengthy, still leaves much to be said, especially as we are all more or less inclined to maintain our hold on generally established theories and ideas, not only as to drift, but in other things as well. With this in mind, it might be well to point out a number of other items which have some bearing on the matter of drift.

So far, nothing has been said of the drift of spherical bullets; and while the discussion of the pointed bullet is by no means complete, there are certain features about the action of the spherical variety which seem to substantiate the theory that the precession of the point of the long projectile is the cause of its drift. They do illustrate a peculiar phenomenon, which might be incomprehensible if we applied our observation of the spherical bullet to the long, pointed bullet without further investigation.

To begin with, we might observe that the old muzzle loaders, from the poorest to the finest in shooting quality, are rifled with a very "slow" twist; a favorite twist during Revolutionary times being about one turn in "half-a-rod," or one turn in eight and a quarter feet. Velocities in those days seldom exceeded 1,200 to 1,500 feet per second, against which today we have some rifles shooting a projectile having twice that velocity with one turns in as many inches. We are told that the old-timers were afraid of a more rapid twist on account of stripping the bullet and because of the excessive drift which would result from more rapid twist. The writer has no experience with projectiles of this kind which would be of value in this connection, but from experience with the short, round nosed pistol ball at moderate ranges, it would appear that this fear of excessive drift was well founded. Almost any revolver cartridge will show this characteristic in a marked degree; the Colt .45 Automatic in a particular case for example, but of course, at ranges which make it of little value as a weapon of precision. The drift is quite noticeable at three hundred yards, and is to the left as is the twist of the rifling in the barrel. Naturally the trajectory is curved like a rainbow at that range, more so than even the old muzzle loaders, but even so, the shape of the point and the short length of the bullet are such as to give results similar to the spherical ball fired from a rifled barrel.

Certainly the advantage of the rifled barrel must have been discovered accidentally, for it does not appear that any satisfactory explanation for its superiority was given prior to Benjamin Robbins' "New Principles of Gunnery," published in 1761. Robbins seems to have been somewhat of an experimenter, even for those days, and as many today are still searching, so he then was seaching out a panacea for the inaccuracy of firearms.

He discovered that by bending the end of the smooth bored barrel he could control the direction of drift from the plane of fire; he determined also are direction of this deviation, as shown below in Fig. 8. He appears to have concluded that a smooth bore, bent at the muzzle, could be more accurate than an absolutely straight bore, for with the latter, the direction in which the sphere rotated could not be foretold; and we know today that if the ball did not rotate at all it would be still more unreliable as to accuracy, as will be shown later. The virtues of rifling he summed up without reference to, and possibly without the knowledge of its relation to drift if he recognized it at all—his contention being that the deviation of the ball from the plane of fire resulted from defection in shape of the forward surface which the rotation of the ball minimized or eliminated entirely, due to it being alternately on opposite sides of the trajectory; certainly a reasonable and logical assumption for the times.

We are here more interested in his findings than in his theories, however. Observe the effect of bending the barrel in Fig. 8 (greatly exaggerated, of course). The effects of bending as shown there are applicable in any plane

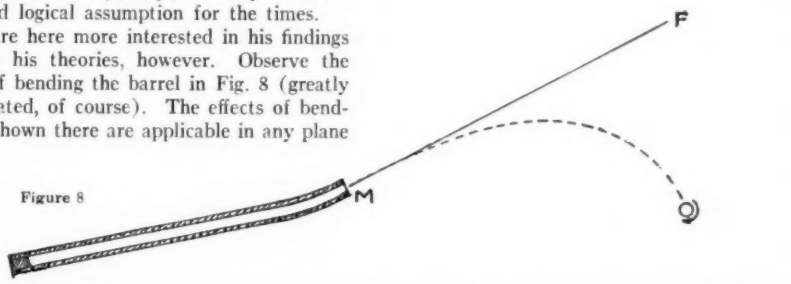


Figure 8

—horizontal as well as vertical. If the figure were an illustration of the trajectory the ball would have a downward curve in any case, due to gravity, but it would drop more quickly than one fired from a smooth bore; but if the barrel were bent *down* instead of up the ball would rise above the trajectory there shown and would travel farther than would a non-rotating ball. These differences would be minute, probably, but still sufficient to affect accuracy considerably. Robbins does does not appear to have explained why the ball should deviate in the way it does—nor did anyone until the time of Magnus, about a hundred years later (exact date unknown to the writer).

Not so long ago the writer felt that there was an error somewhere in handing down the findings of Robbins; for if we do not take into account the properties of the atmosphere around the projectile in flight, we are prone to assume that the spherical ball shown in Fig 8 will drift in just the opposite direction to that found by Robbins—and Magnus. Certainly the friction of the atmosphere retards the rotation of the sphere, and certainly the greatest friction is opposite the direction of rotation; therefore, if frictional resistance to rotation is the cause of drift, the drift will be in the opposite direction to that shown by Robbins, as in Fig. 8.

We considered another item: that the spherical ball is as truly a gyroscope as is the long bullet, if both be spinning; it will certainly exhibit the same characteristics in flight as the long bullet. Suppose we apply the laws under which the gyroscope operates to the projectile shown in Fig 8. In doing so, we get nowhere, for if Fig. 8 be a view of the trajectory, the resistance to rotation operates merely to retard the rotation of the sphere and does not tend to tilt the axis of rotation; since it does not, it cannot cause precession or any similar phenomenon in this case. This would not be the case if the ball issued from the bore with its axis of rotation parallel to the trajectory. Therefore to test the truth of Robbins' statement without spoiling a perfectly good smooth bore, or rigging up a gas pipe and screens along the path which must be guessed at, it was necessary to improvise apparatus and procedure which would make it easy to determine the direction of drift, and which would eliminate the effect of gravity on the ball in flight. After considerable thought upon the matter, it appeared that by making use of gravity to propel the experimental projectile, and imparting the spin before starting it upon its course, this could be done.

Accordingly, a number of golf balls were provided with pivots upon which they could be rotated, and a suitable frame for holding them during the process of rotating them was made. The spinning golf balls were then dropped from a high trestle, with their axes horizontal, and their progress observed. The drop was 175 feet to the tracks below, and in spite of preconceptions to the contrary, they did just exactly what Robbins said they would do, as shown in Fig. 9. In spite of the fact that the spin of the balls was quite slow, the curve was quite pronounced, even against a high wind. It was feared for a time that this wind would affect the results of the experiment, since it was a force at right angles to the flight of the ball, just as the resistance of the air to the fall of the projectile in approximately horizontal flight acts at

right angles to the course of the same. But changing the angle of the axis of rotation in any direction brought corresponding change in the curvature of the ball, so it was concluded that the wind was not strong enough to affect the results. As a matter of interest, several balls were dropped without spinning them; their course is shown by the dotted line in Figure 9—a straight fall until the increase in velocity gave rise to enough resistance to "spill" the ball off to one side, after which the same thing is repeated a number of times. We could expect the non-spinning spherical projectile to act in somewhat the same manner—hence we could not and do not expect much accuracy from them.

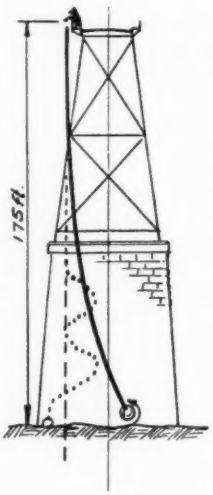


Figure 9

Now, after determining what happens under given conditions, it is in order to find out why it happens so. It appears that though air is a rather tenuous gas, it still possesses considerable viscosity. The latter property, you may not know, is one common to practically all gases and fluids—even steel is credited with it in a certain sense. The word is used to denote the internal friction of a substance; we might say it is a measure of the friction between the particles in motion. Because of this property, molasses will not spill over the side of the containing vessel if it is tipped up-unless it is left there for some time; likewise, due to the viscosity, the urchin need only to stick his fingers (or his whole hand, as the case may be) into the molasses for his share of the sweets, for the molasses which sticks to his skin also carries with it other particles of the same fluid. In the case of the urchin, all this molasses will come off very quickly, either by way of his mouth or his mother; but the more dignified person who reaches for the elusive wash rag will find that a good deal of the said molasses drips off. Perhaps this gives you some idea of viscosity; if not a formal discussion may be found in any good text on physics.

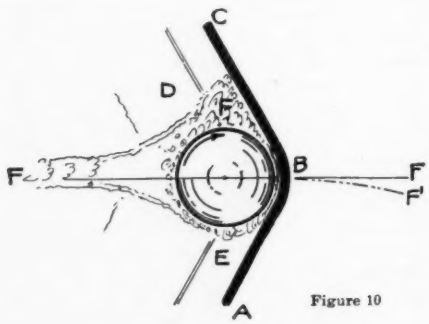


Figure 10

Thus, in the case of the spherical ball shown in Fig. 10, we have friction between the forward face of the ball and the headwave; this friction retards the rotation of the ball to some extent, but it also brings about the same sort of phenomenon which the sweet seeking urchin does with his fingers. It drags some particles of air from the headwave, but it certainly seems from all the evidence that the friction between the face of the sphere and the air is less than the internal friction of the latter. If this were not true, the sphere would drift out of the plane of fire FF, the same as though it were rolling along the top of a table or surface similar to the headwave ABC. Therefore, due, let us say, to the greatly increased viscosity of the headwave, comparatively little air is dragged rearward from the headwave from the point B; but on account of the rarefaction of the air in the space E, and in consequent lesser viscosity, some of the air from this locality is dragged around by the surface of the sphere. Perhaps a part of this is lost in the vacuum behind the ball, but sufficient remains and is replaced by more from the space D to pile up against but behind, the headwave, as shown at F.

The forward momentum by this part of the system (the air of F) being greater than at the opposite side, gives a one sided effect, tending to move the upper half of the sphere forward faster than the lower half; in addition, the air at F, in being driven and held against the headwave at B will exert a pressure toward E, hence the course of the sphere is along the line FF', a curved path, instead of in the plane of fire FF. The kernel of the whole phenomena rests in the fact that as air is compressed as greatly as it is in the headwave preceding a projectile in flight, its internal friction becomes greater than the friction between it and the surface of the sphere; further, the atmosphere in the headwave, due to peculiarities and limitations of wave motion in air, keeps itself intact, so that the air at F, impinging upon it, does not enter the headwave and become intermingled. It is analogous to trying to mingle a stream from a garden hose with the stream from a high pressure hose—it can't be done at the nozzle, for there is too much energy in the one and too little in the other. Kimball, in his "College Physics" gives only a hint of the explanation for the curving ball, and credits the difference in momentum with the force deflecting the ball from its plane of departure. However, since he credits the same cause with the drift of the long projectile, it would appear that not a great deal of thought has been given to this particular time, which is certainly excusable, considering its small place in that text.

But at least we now have a good, consistent working theory which we can apply to the projectile in flight. The fact we know; some of the foregoing, called theory, we know to be fact; but until we have the photographic studies upon spherical projectiles equal in extent and in technique to those upon the more modern projectile, some of it will remain theory, and plausible as it may sound, it is not so satisfactory as certain knowledge.

As to why the spherical ball should drift when fired from a rifled bore, which spins the ball so that its axis of rotation is parallel to the trajectory at the muzzle, it is best here to say only that the curvature of the trajectory furnishes the clew here also. The spherical ball, spinning, is as truly a gyroscope as the long, pointed bullet; but it cannot be said *ipso facto*, that the axis of the spherical bullet precesses in the same manner as that of the long bullet; it does not appear to the writer that it will nor that such precession will result in drift. No doubt the Magnus effect will result in drift, acting eccentrically because of the curving of the trajectory will furnish the force which curves path of the sphere laterally and because the spherical ball has such a poor ballistic coefficient, the downward curve becomes pronounced comparatively near the muzzle. In the opinion of the writer, both the sphere spinning with its axis parallel to the line of departure and that perpendicular to the same, but in the plane of fire, will describe at least one reverse curve, after which the flight will remain in a vertical plane, which plane may or may not be parallel to or at an angle with the plane of fire. (To clear up any possible misconception of terms, it should be remarked that the plane of fire is a vertical plane passing through and extending beyond the bore—in a straight line, naturally). This phenomena will occur at a range beyond which the sphere will never be useful as a projectile; and since the day of the spherical bullet is past at medium and long ranges, the matter is possible only of academic interest and really has no place in this discussion. Therefore we will go on with the modern projectile.

Perhaps you have noticed that an ordinary top, whose point is considerably blunted from frequent spinning, when first set down precesses quite noticeably, but if sufficient force has been used to spin it, so that it will remain spinning for some time, the axis of the top grdually rises and assumes a vertical position, remaining there for a time depending upon the mechanical perfection of the top and its rate of spin. It is so common an occurrence that most of us can remember it without refreshing our memory. We have probably satisfied our minds with an explanation somewhat as follows: "If we spin the top fast, it gradually straightens up and stays there until it has lost its speed; if we do not spin it fast it never rises and soon falls, therefore the speed of the top determines whether or not it rises after being set down."

But now, suppose we take a top with a hard, sharp point, and spin it as fast as we like, thereafter setting it down on a hard, smooth surface—say in a smooth bottomed glass or chinaware bowl; observe that the top does not straighten up, no matter how long or fast it spins. The true cause for this action is not a matter easily arrived at, in spite of the fact that it has been ascertained several hundred years. Until this action of the top was explained by Newton (Sir Isaac) astronomers were considerably worried as to the correctness of their assumptions in computing the motions of the earth and other planets—

as has been said before, the principles underlying the action of the top, the projectile, and the planets, are the same. Newton gave the explanation, and showed that the mathematics and mechanics of the then astronomers were based on assumptions which he proved to be correct, but that their analysis of the top was at fault.

It has been remarked that the rotation of the axis of the top about a vertical line through its point (its precessions) is much slower than the rotation of the same about its axis; as a matter of fact, the faster the top spins, the slower the axis swings, and vice

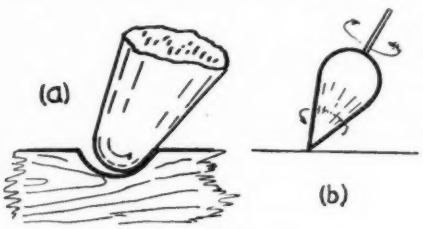


Figure 11

versa. This fact gives rise to the straightening up of the top's axis, as will be shown.

Figure 11a illustrates the position of the rounded point of the top in Fig. 11b, when the latter is setdown on a surface soft enough to allow the point to work out a small depression, as shown, the top, instead of resting exactly upon its point, bears against the side of the depression hard enough for it to give rise to friction between the rotating surface and the depression. Due to this friction, the top tends to roll along the side of the depression; since the rotation of the top is much faster than its precession this action accelerates the precession; and the acceleration of the precession, no matter from what source, causes the axis of the top to rise into the vertical position and stay there. We can attain the same result by pushing the peg of the top around its circle of precession a little faster than it would go if left to itself. This information gives us what we need to explain one more item relative to the action of the pointed projectile which further substantiates the theory that there is precession of its point.

It is important here to recall that the top has its precession because of its nutation; indeed, the circle of precession usually shown is merely the line bounding the outermost (or innermost) reaches of the loops which form the path of the peg of the spinning top. (See Fig. 4.) Almost any pointed projectile will show the same characteristics or motion immediately upon leaving the muzzle, due to mechanical imperfections, and upsetting in the bore—or any of a number of causes which may operate to cause a bullet, no matter how perfect before firing, to become slightly unbalanced. But the fact that is of great interest here is that this nutation and a large part of the precession which is due to the unbalanced condition of the bullet, are damped out in a very short time. This is particularly true of the spitzer bullet, but to what extent it is so of the blunt nosed bullet the writer has no information upon which to form very definite conclusions.

To digress for the moment into the field of photography, it is observed that the spitzer bullet, at velocities around 2500 and upwards, travels with its point *through* the headwave, as shown in Fig. 12, instead of following immediately behind as does the blunt nosed bullet in Fig. 13. This makes possible an action similar to the friction at the point of the top in Fig. 11, except that we must consider the nature of matter upon which the point "rolls." Turning now to figure 14, which shows an enlarged view of the projectile in Fig. 12, we have there illustrated the conditions which bring about the damping of the nutation referred to.

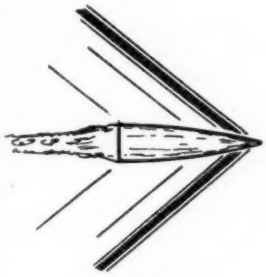


Figure 12


Figure 13

We have thus far attempted to analyze the action of the projectile in flight; but for the time being it will be easier if we reverse conditions a bit, *i.e.*, consider the projectile at rest and the air in motion with a change in direction of that motion to correspond to the curvature of the trajectory if the projectile were in flight. This is a perfectly reasonable and logical disposition to make of the forces for theoretical analysis, in spite of the fact that we could never actually accomplish it. But it will serve the purpose of illustration without affecting the validity of the conclusions reached thereby.

With the above condition fulfilled, the point of the projectile will move as shown in (a), Fig. 14, the nutation being shown by the loops, and the limiting circle of precession (which is not the path of the point, mind, but merely the limits beyond which the point does not go) bounding the loops. Figure 14b is an enlarged view, looking from behind, with the projectile rotating clockwise, at the point *A*, Fig. 14a. For all practical purposes the point swings about with the center of gravity as the foci or center of revolution, so that both ends of the projectile describe similar figures, but in reverse order. According to Magnus' theorem, the pressure built up by the particles of air carried around by the surface of the point in contact with the headwave will build up at the right of the point, between it and the headwave, and this pressure will accelerate the precession of the point in the direction of precession, that of the arrow *CD*. The relation shown at *B* will remain constant throughout the path of nutation; at all points of the path the acceleration will be in the direction of precession. As in the case of the top, this acceleration will operate to damp the nutation and straighten up the bullet into the line of the force acting, which is tangent to the trajectory at all points. If the direction in which the air current moved remained unchanged, the point would soon cease even precessing, but since the projectile in flight descends in a curve of increasing curvature, a force resulting in the precession of the point is always present. In the case of the top this precession has a circular path, but in the case of the projectile shown in Fig. 14, the path of the point in simple precession would be more of an ellipse, possibly a crude one, than a circle, as shown in Fig. 14c.

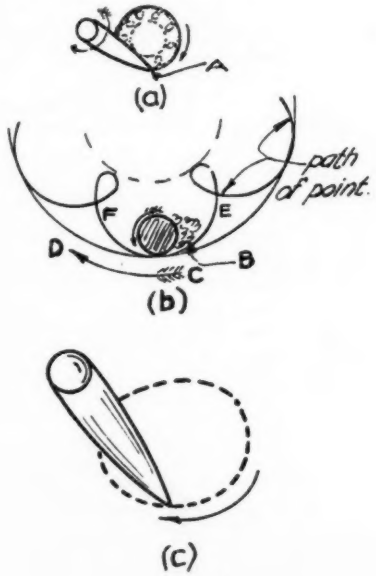


Figure 14

Having now arrived at a conclusion as to what can and does happen, it might be instructive to see what cannot happen, especially in view of the numerous "explanations" which have been made of drift and its causes. If now you turn back to Fig. 14b, and imagine the arc *EF* to be a sheet of water or some other fairly solid substance, it is immediately apparent that the friction between the point and the surface *EF* would force the point opposite the direction of the arrow *CD*. It so happens in this part of the path that the effect would be to incline the point to the right of the plane of fire; and upon the assumption that the long axis of the bullet remains parallel to the bore of the rifle, so, the explanation goes, the drift is to the right if the twist of the rifling is in that direction. Precession is entirely disregarded by these theorists. If we went a little farther with this particular point, it would be apparent that at the upper side of the circle (by your leave) of precession, the point would be inclined to the left from the same cause as it inclined to the right in the lower part of the circle. We would thus have a spiral described by the point, but no drift would result, since they would be equally on both sides of the plane of fire. As a matter of fact, the foregoing is academic, purely and simply, for a long continued application of friction applied in that manner, disregarding the Magnus effect, would retard the precession of the point (*Concluded on page 24*)

Larger Calibers for Deer

By W. H. Pyne

LATELY there seems to be more than the usual amount of doubt of the killing ability of the small bore high velocity rifles. Of course this question is not new, but has arisen from time to time ever since the first small bore rifles came out. Any one who expressed himself along these lines however, was immeditely squashed by the advocates of the small bores, who pulled the table of ballistics on the attacking parties and put them to route with a volley of figures on velocities in feet per second, great striking energies in foot pounds, penetration in pine boards, steel, etc. After which the doubter took another think and decided that may be it was all right after all, bought himself one of the new rifles and threw the old .44-40 or .45-70 into the cellar or attic, or wherever he was accustomed to storing worn out or discarded junk. Anyway the new rifle was lighter and it certainly did shoot flatter. Most anyone could see that, even without consulting the table of trajectories.

As time went on however, and many wounded deer escaped, the old doubts returned, and the question was more and more frequently raised as to the ability of the small bores to kill surely and quickly.

Of late years the trend has been toward still smaller bores, with yet higher velocities, for all of which greater things are claimed, which have in many cases not proven true under actual hunting conditions. Nearly all of these higher velocities were obtained at the sacrifice of bullet weight. This in itself is a doubtful step; although the lighter bullet at greater velocity shows a greater energy in foot pounds, when figured out on paper, but--as many people are finding out—paper foot pounds are not always an indication of killing power.

These light bullets generally lack penetration and are liable to break up close to the surface, thus causing a large surface wound that is not immediately effective. On the other hand, a heavy, slow speed, small bore bullet, may not expand enough on impact and so get through without making much of a hole, but expending most of its energy on the hillside; instead of within the body of the animal struck.

Another argument that the small bore, high velocity advocate puts over against the old slow speed large bore with its heavy bullet, is that of superior trajectory. "It shoots flatter, therefore you can hit your deer up to 300 or 350 yards without change in sight elevation." This is a much overworked argument, as few deer are ever shot at 300 yards. In fact, few are hit at a greater distance than 200 yards; with any kind of rifle. I know men who have hunted for a great many years, with everything from the old muzzle loaders down to the latest high velocity arms, and I have never heard one of these men claim that he could hit a deer at 300 yards or more; according to them it is just one of those things that might happen. I have heard many men who were new at the game make the statement that hitting a deer at 300 yards was easy —"Sure, do it every shot!"—but when I led them out into the back yard and pointed out a target, set up at 300 measured yards, it was a different story.

This target was a piece of 3-8 inch boiler plate, 10 x 14 inches painted white and hung by wires against a blue-gray rock cliff. It loomed up fine and gave off a loud clang when struck by a bullet, so there was never any doubt about the hits or misses. In spite of the fact that it looked easy, this target was a hard one to hit and in the five or six years that it was doing duty the percentage of hits was surprisingly small. I always contended that any one could not hit this plate regularly —say three times out of five shots—had not much chance of killing deer at 300 yards. In all the times it was tried this score was never made, and it was tried by many men who were considered good shots on deers. This fact—coupled with what the old timers told—led me to believe that any deer was pretty safe at any distance over 200 yards and that very few were ever killed at a greater distance.

Of all the cartriges on the list, the .44-40 shows up about the worst for paper ballistics, especially the black powder and low pressure smokeless loads, but I know several men who have dug their old model '73 out of storage and bought a supply of low pressure loads for it and claim they get just a little better results with it—as far as killing power is concerned—than they did with the small bores. These men also claim that the old guns shoot plenty far enough for them and that they never could hit a deer at those long ranges even with the small bore rifles that were supposed to be built especialiy for that kind of work. Yes! I think we can safely say that 200 yards is about the extreme distance that the average shot can be reasonably sure of hitting his deer.

There are two things lacking in these small bore high speed bullets. One of these is the smallness of the caliber itself and the other is the lack of weight. I do not consider a bullet of less than 200 grains weight heavy enough for deer. This weight of metal is not found in anything less than the .30 calibers and many of these are lacking in this respect, therefore a caliber of .30 is the smallest bore that should be considered and for myself, I prefer something a little larger. Even with the 220-grain bullets, as in the Krag and Springfield, there are too many times when they do not have the desired effect. All small bore bullets, regardless of weight, depend on their, mushrooming effect to make them effective on large game and the lighter higher velocity bullets are liable to upset and go to pieces too soon, while the heavier slower speed bullets, of these calibers may not upset at all unless they strike a bone.

The shape of the point also has a great deal to do with the killing power of bullets. A flat nosed bullet will deliver a greater shock than the round or sharp points. It also seems to me that a lead bullet, or jacketed bullet with lots of lead exposed, is better than those which are capped with some harder metal. Soft lead seems to have the ability to deliver a stunning blow, even when it does not upset very much. I long ago found out that the .22 long rifle was a better killer of jack-rabbits than the full metal patch Krag. This is not due to mushrooming of the .22 bullet, as most of them that were found in the dead jacks had not upset very much, and none—that I ever found—were expanded enough to make then the equal in diameter to the .30 caliber.

Let us go back to the question of killing power compared to energy . Let us, as an example, take the new Remington hi-speed load for the Springfield, with its light 110 grain bullet and the 50-110 Winchester Hi-Velocity with is 300 grain bullet. In this comparison the big bore heavy bullet figures out to considerable less energy in foot pounds than the smaller lighter bullet, but for all that I certainly would consider the big bullet the best killer up to 200 yards. Surely, with it, we would not have badly wounded deer escape and not found until several days later, and only found then after buzzards have shown the way. Such instances are entirely too frequent where the small bore light weight bullets are used.

I consider the .33 W. C. F. and the .35 Remington about the two best deer combinations on the market at the present time. The rifles are light in weight and they are good killing loads, although I consider the .33 to be slightly the better killer because of its flat nosed bullet.

I think the present trend toward light bullets and greater velocities a step in the wrong direction. I consider 2,000 feet seconds to be sufficient velocity for hunting purposes, and that when great power is desired it should be obtained jointly by larger bores carrying heavier bullets.

Let us forget these paper foot pounds and super-velocities for a while and look up the actual results in the field. After all, this is the final test and those old timers who are going back to the big bores surely know what they are doing.

A New Form of Target Pistol

By Thos. C. Harris

UNLIKE practice with the rifle the pistol has only one point of support—the hand that holds it, and necessarily with the hand and arm extended from the body. This condition greatly magnifies the tremor of the hand and arm muscles and the movement becomes most apparent at the muzzle, since the muzzle projects some distance forward of the hand.

The exact alignment of the axis of the barrel, at the precise moment that the bullet leaves the bore, determines the place on the target where the bullet will hit. This deviation from the mark which the shooter wishes to hit is somewhat surprising, when we consider what a slight tremor will do.

Using a sighting base of eight inches, which is about right for the military revolver, we find that for a distance of fifty yards the proportion is one to 225. That is, the actual amount of wabble at the muzzle, from a true alignment, will cause the bullet to strike the target 225 times the wabble to one side or the other. For example the tremor at the muzzle, if for only one sixteenth of an inch, will cause a deviation of 225 sixteenth in fifty yards, or a trifle of over fourteen inches.

The muzzle sight is about one sixteenth of an inch in thickness and very few of us can consistently hold to that narrow space. This estimate assumes that the breech end of the barrel is perfectly steady, which is rarely the case in offhand shooting. The perfect coordination of the muscles, with good eyesight, resulting in firing at the exact moment we cover the target, makes a good marksman. With the usual hard trigger pull this is well nigh impossible with the most of us.

That any well constructed pistol, with proper ammunition will shoot closer than anyone can hold, is admitted everywhere. I have seen two-inch groups, at fifty yards, fired from a ten-inch target pistol in a machine rest. That will show what the barrel can do, provided we hold it right. But human eyesight and human muscles have their limitations and we cannot reach that perfection, therefore I believe that my device to improve our holding is desirable.

In order to effect a more steady holding and to diminish the tremor at the muzzle the writer has tried the effect of placing the handle of the arm as near to the muzzle as possible. This unique arrangement of the grip has the effect of steadying the muzzle and leaves the barrel extended backward, over the wrist and forearm. This plan makes an odd looking arm but it results in more accurate shooting, for the reason that the muzzle is more steady. The rear sight comes closer to the eye, which is some disadvantage, unless some form of peep sight be installed.

The illustration shows a ten-inch barrel, .22 caliber, bolt action. The trigger, which is just under the muzzle, is connected to the sear by means of a rod, lying in a groove in the stock, under the barrel and out of sight. I find that this novel arrangement makes a much more steady hold, eliminating most of the wabble at the muzzle.

If wanted, there is provided a strut pivoted on the right hand side of the stock, at the breech but not in sight in the illustration. The strut is about two and a half inches long, when set at right angles to the barrel, and its lower end rests on the forearm, between the wrist and the elbow. The gun is then supported at both ends and is very steady.

To a man who has been an inveterate pipe smoker, for some sixty years, this "son of a gun" is a distinct advantage in target shooting. I find that too much devotion to Lady Nicotina makes a steady hold well nigh impossible without some such support, as designed and whittled out by yours truly.

Any gun crank, who is handy with tools, can construct for himself a target gun as illustrated. The barrel is a Winchester, .22 caliber, model '02, cut down to ten inches long. The bolt action, with sear and extractor, the same as found on that model. The twist of the rifling is one turn in ten inches, which will handle the long rifle cartridge. The stock is of black walnut, one and one-eighth inches thick.

To operate the sear, from the trigger at the muzzle, is the only difficult part of the construction. The trigger is secured to and forms the front end of an eighth inch rod which lies in a groove in the stock, directly under the barrel. In order to pass by and not to interfere with the stud which holds the barrel and sear springs, the rod must be bent to one side at that point, returning again to a center line after passing the stud. The bell-crank lever is of steel or iron plate, one eighth thick. The lower arm of the lever is as long as the depth of the stock will allow and should be longer than the other arm which engages and trips the sear.

The rear end of the trigger rod just touches the lower end of the bell crank lever, the upper and shorter arm just enters the slot in the sear. This arm should be long enough to allow the bolt to be drawn back and so work the extractor, the arm of the lever and the sear slot always engaged.

On pulling the trigger the rod operates the bell crank, pushing it to the rear, which pulls down on the other arm of the lever, thus disengaging the sear. To do this without too strong a pull on the trigger is a matter of trial and adjustment. The sear spring of that model is much too strong but may be made weaker by grinding it thinner for its entire length.

The notch in the sear, holding the firing pin at full cock, may be eased off with the corner of a hone or a whetstone. The trigger rod is held in its forward position by a spiral spring or a V spring, as shown. This spring need be only stiff enough to keep the rod in its forward position and to give way easily under the trigger finger. Any form of sights may be used. In the illustration the fore-sight is a small ivory bead and the rear sight a common form of open sight. The diagram is a center line section, showing the various parts and corrections.

I wonder how many other peculiar weapons of odd type have been made by brother riflemen throughout the country. It was mainly in the hopes of hearing of others that I wrote down these few lines and sent them in for publication in our magazine. Let's hope some other readers will do likewise regarding his latest.

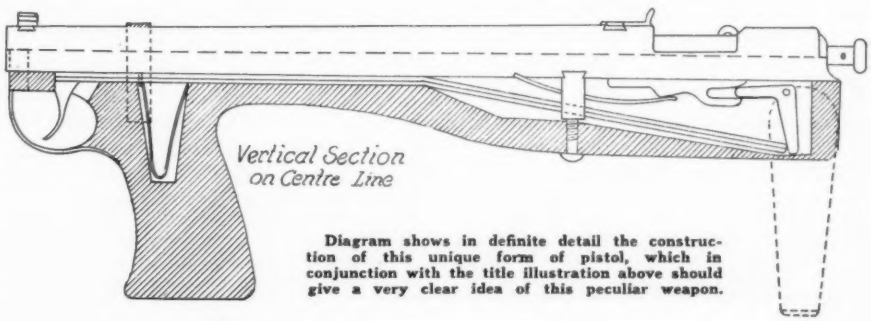


Diagram shows in definite detail the construction of this unique form of pistol, which in conjunction with the title illustration above should give a very clear idea of this peculiar weapon.

The American Rifleman

EDITOR
THOMAS G. SAMWORTH
Advertising Manager, J. R. MATTERN
Art Editor, C. J. SMITH

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★ THE OREGON TRAIL. 1845.

When the vexatious question of our boundaries in the great Northwest was settled by treaty with Great Britain in 1846 both countries heaved a sigh of relief. Lots of conversation and war talk had been spilled but no blood. We were satisfied. It was a cheaply acquired slice of God's earth—bigger than most principalities and as large as not a few kingdoms. Great Britain was satisfied, perforce, and besides it was "a long way to Tipperary" or rather Oregon Territory in those days, and a war for possession so far from their base did not appeal. The Canadian factors of the Hudson Bay Company roared. You'd roar too, if you lost what they did.

Then came the settlers—"Down Easters" from the Sea Board States of the East: Kansas, Missouri, Ohio, Pennsylvania—from everywhere. By 1847 the Oregon Trail was as commonly known as the Lincoln Highway.

THE National Rifle Association announces the reappointment of Captain Grosvenor L. Wotkyns, Ordnance Department, to be Captain of the Small Bore team which will defend the Lord Dewar Trophy against England, Canada, and Australia in September at Camp Perry.

THE AMERICAN RIFLEMAN regards this appointment as a happy choice of the right man for the job. Captain Wotkyns was a skilled civilian rifleman long before he entered the Army.

The Dewar Captaincy

His service in the Ordnance Department, and experience in the selection of rifles for National and International Matches has given him technical experience equaled by very few men. Personal experience in matches of all descriptions, including repeated membership on Dewar teams of past years, has rounded out his knowledge of the art of piling up winning scores under all varieties of conditions that may be presented. He has the cool, resourceful temperament that lends confidence to the team members and inspires them to give the best that is in them. His experience as captain of the winning team of 1924 adds the Cap-Sheaf to his qualifications.

We congratulate Captain Wotkyns, and at the same time we congratulate the Dewar Team soon to be chosen, that a long step toward victory in September has already been taken.

* * * *

IF every police chief in bandit infested parts of the United States would read and profit by the Example of Los Angeles a long step would have been taken toward the normal enforcement of law and order. This issue contains the story, under the title, "Cashing In on the Course." It bears out so conclusively the oft-repeated statements of this magazine that only a sense of sportsmanship prevents us from saying "We told you so!"

An Object Lesson for Police Chiefs

The Los Angeles police, under the leadership of a progressive Chief, and backed by a practical Mayor, have put the fear of God into the criminal element of their community. Straight thinking and straight shooting, combined, have turned the trick. No thug element in any community will take chances with a police of which a large percentage is known to be qualified as sharpshooters on the N. R. A. pistol course. Chief of Police R. Lee Heath has no doubt lightened immeasurably the burden of law enforcement by the practical demonstration that whenever a crises occur his men will shoot it out, toe to toe with the local gunmen, and score the most hits. That is what counts. The policeman or the soldier who is under orders to attack and who does not know how to use his weapon is placed in a cruelly unjust position. No wonder if untrained police fail at times to maintain order. So would you, or any other man. Such police are an expensive luxury to taxpayers, but the fault lies with the department heads, not with the men who have the shooting to do.

* * * *

FIVE days ago, the 1925 International Rifle Team landed at Cherbourg en route to the scene of their battle royal at the Canton of St. Gall, Switzerland. On the 13th of this month they undergo their trial by fire among the pick of European marksmen. Carrying the treble load of untried team mates,

How About It?

defense of a World's Championship, and competition on a foreign range, they will give the best that is in them to retain for this Nation the prestige, it now holds as Champion of the World.

The N. R. A. sent them over "staking" them in advance in the belief that the Riflemen of America wanted to be represented in the International rifle game. So far, the support given the Team has been disappointing. It is the contributions of one dollar from *every* shooter which build up these funds and which build up Team morale by showing the men on the firing line that the folks back home are supporting them to the best of their ability. If you want America represented in the Internationals say so—with a dollar. Whether you think we should be represented next year or not, if your sympathies are with the boys who are over there and who have to get back, show it—with a dollar.

Entered as second-class matter, April 1, 1908, at the postoffice at Washington, D. C., under Act of Congress March 3, 1879. Obtainable by subscription, $3.00 per year. $2.00 to individuals or members of clubs affiliated with the N. R. A. Canadian subscription, $3.50. Foreign, $4.25.

The Hi-Speed on Small African Buck

By J. R. Nowell

I HAVE just had an opportunity of giving the 110-grain 3,500 feet per second bullet a little tryout.

During a lull in the electrification construction I took a three-day run out into Zululand, and it was a truly enjoyable trip. Cool weather, fine walking in open "bush" land mostly, and delightul air and scenery.

I had never tried out the above bullet, and had heard very little concerning its effect on game; so you can imagine how anxious I was to see how it worked out—and I found out.

The rietbuck ram shown in the picture was 160 yards distant. I shot at his neck in order not to spoil any meat, knowing that if I missed with the first shot I could get several more running, as he was right in the open when I rounded the one bush hiding him. He crouched to hide, just as a quail would. At the shot he just rolled over stiff, with scarcely a movement. The bullet did not touch a bone, but went above the backbone, through the neck muscles. I do not think any other bullet I have ever used would have produced such an instantaneous effect in a similar location.

The rietbuck is a little smaller than the average Adirondack deer, but heavier for his weight. The *shikaree* with the slim *assegai* (a-se-guy) had to make several efforts to get it into his throat (to bleed him) before he could succeed. The skin is thin, but very tough. The bullet, or at least part of it, went all the way through, but made only a small hole where it came out. The tissue was badly torn inside, but the particles of the bullet must have been so small that they were unnoticeable.

Rietbuck. A Species of African Antelope on which the 110 grain Hi-Speed bullet is particularly effective.

Just about dusk the shikaree located a duiker on the edge of the thick brush. I could just make him out, but had to try several times before I could locate him through the sights. I let him have it, and saw him make a little run, and supposed that I had missed—the range was 315 yards—but on going over we found him lying only about 20 feet from where he was struck. The bullet penetrated at the rear edge of the left lung, and went quartering back through the paunch, coming out on the far side, with only a small hole of exit, and the copper sheath of the bullet was in the hair on the *outside* of the skin. The heart was not touched.

The duiker is extremely tenacious of life, and has the reputation around here of carrying away more lead for his size than any other buck, and I think that the 3,500 feet per second bullet, placed in this location, is about the only one ever made that would have stopped him inside the few yards he had to run before reaching the thick bush.

There was scarcely a drop of blood in either of these cases, which were the most remarkable experiences I have had, showing as they did the tremendous stopping power of the bullet, even when not perfectly placed. With very many other kinds of bullet, these animals would have surely gone on.

Another remarkable illustration was in the case of a bushbuck, crossing at high speed. He was about 100 yards distant (not stepped) and was going so fast that I did not lead him enough and the bullet took him through the back of both hind legs, and practically all the meat of the thighs was blown away. He went down instantly. No sign of the bullet was to be found.

The other shots I got of game were chest and heart shots, and would have been fatal with almost any kind of bullet but all illustrated the tremendous knock-down effect of this bullet. It may spoil a lot of meat if not placed right, but it surely does not let the animal get away into the woods to spoil, and for this reason it should be highly regarded by all humane sportmen.

The sound of this bullet seems usually very loud. I shot a steenbuck in the chest with the 180-grain, 2,700 foot bronze point bullet, and he ran quite a few yards before falling, though he was badly torn up. This is "some" load in itself, but I think if the shot had been with the 110-grain bullet, he would not have moved from his tracks.

The bushbuck is a little smaller than the rietbuck, and the duiker is about the size of a big dog, while the steenbuck is still smaller. Lack of time prevented me from trying this bullet on any larger game, but hope to later.

There was an obstreperous rhino in the locality, on which I had no desire to experiment with this 110-grain bullet. I think it would have made an awful big black-and-blue spot under his skin, but that was probably all. Besides, I did not have a license to shoot him! A short time previously he made a white man drop his gun and go up a thorn tree, where he had to stay in a very uncomfortable position for quite a while.

I had with me some armor piercing steel core bullets that I intended to try on him if it had been necessary. They were given me by a friend who had used them on tanks during the war, and I think this would have been a very appropriate use for them, as the rhino is about the nearest living approach to the tank.

Estcourt, Natal, South Africa.

* * *

Set Triggers

By A. K. Friedrich

ARE set triggers a benefit or a detriment? I used to think they were a a benefit, then I thought they were a detriment, and now I have no convictions one way or the other.

It is easier for me to make a good score using a set trigger. Therefore set triggers are a decided advantage. But here is the comeback. I have tied every score I have made using set triggers with a rifle having a three-pound trigger pull. Somebody will rise up to say that my Winchester 52 is a better gun than my Schuetzen. Not so. The Schuetzen rifle will shoot ten X's with ten shots at 25 yards which is all that is required at the present time. Then, too, some scores were shot with the same gun. I shot at 96 and a 97 standing in the gallery using the set. As these were very unusual scores for me I said I was off the three-pound trigger for good. But the N. R. A. standing match came along the next week. Shooting the same gun and using the set, pulling the front trigger only (it pulled nearer five pounds than three), I shot a 96 and a 98. There I was all at sea again. It took more will power to make a good score without the set, but the scores were just as good. What I cannot understand is why the same amount of effort will not produce a better score when using the set.

My experience in the 100 yard free rifle match checks my gallery experience exactly. I shoot the Schuetzen rifle in that match because it produces a good score with less work, but no amount of effort will make it produce a better score than the 52. I have asked our psychologist about this, and he says it is due to rythm. When you synchronize the eye and the trigger finger you get a bull's-eye, and when you fail to do so you get a miss. All very true but how does it help the score any?

The report of the Indoor American Record Match for 1925 sheds no light on this subject. F. E. Border is in first place with a new record using his pet Peterson-Ballard; but right behind him shooting a Winchester 52 is Harry Palmer with a score which also betters the old record.

So will someone who really knows tell me whether set triggers are an advantage or not? I like to have convictions on a subject and not be in such a state of uncertainty.

Theories of Drift

(*Concluded from page 19*)

beyond that necessary for the stability of the projectile, and the early result would be key-holing or tumbling end over end. Admitting that this latter fact may not be entirely clear to the reader from the evidence presented, it can be pointed out that if the friction were present in such magnitude as to overwhelm the Magnus effect, the point of the bullet would not straighten up, *i.e.*, the oscillations and nutation of the point of the projectile would not be damped out soon after leaving the muzzle, but would increase in magnitude. We know that this does not happen to the general run of projectiles, therefore we must exclude this theory as accounting for drift. We know there is *some* friction of this kind, for the rotation of the projectile is gradually reduced, but it very evidently is not of sufficient magnitude to overcome the Magnus effect; if it were, needless to say, we would still be using the spherical projectile—and probably the muzzle loader.

It will doubtless have been noticed by the reader that no attempt has been made to explain the principles underlying the motion of the top and the projectile in flight—at least none of the laws of dynamics have been touched upon theoretically. Nothing is further from the writer's intention than to attempt such a thing, and if the reader were to examine some of the texts on dynamics and celestial mechanics (which is the same) he would do more to justify this intention than anything which could be said here. It has merely been attempted to set down the findings of the physicist and the mathematician in plain English, and to carry through the statement of the theory of drift with the correlation of the abundant facts which substantiate it, as completely as possible. One of the principal reasons, and the writer feels, the only justification for the foregoing manuscript lies in the fact that after nearly a year of diligent search for a complete and accurate treatment of drift and other subsidiary motions attendant, none has been found—possibly none has ever been published. If the foregoing explanation is far from clear, it is hoped that reader will make allowance for the nature of the problem discussed—it is not a simple one.

A text of more technical nature is out of place here, but for the reader further interested in the motions of a projectile in flight, it is suggested that he consult the publications below, to which the writer acknowledges indebtedness for some of the material in this manuscript. It has been hoped by the writer to attempt some explanation of the drift of spherical projectiles, but until the time and opportunity have arrived for further experiments in this line, should the problem ever become more than one of academic interest it does not seen advisable to assert much theory. Always the fact is so much easier to observe than to assert something as fact when it remains a theory—if we wish to be truthful.

The following list is recommended for the student of ballistics:

"The Flight of the Bullet from Powder to Target," by F. W. Mann, 1910, Munn & Co.

"Ordnance and Gunnery," Lt. Col. Wm. Tschappat, 1917, John Wiley & Sons, N. Y.

"Introduction to Ballistics," Ordnance Department, U. S. A., 1920, Washington, D. C.

"A Course in Exterior Ballistics," Ordnance Text Book, Ordnance Department, U. S. A.

"Treatise on Dynamics," Gray.

"Physics," Vol. 1, Gray.

"Higher Mechanics," Lamb, 1920, Cambridge Press.

"Hydromechanics," Sir Alfred George Greenhill, article in 11th ed. Encyc. Brit.

In Re the Extractor

By Louis V. Manning

FRANKLY, I am biased. My eye teeth were cut on a Beal's pattern revolver with which one of my dad's neighbors had freed all the slaves. At my eighteenth milestone, this bias had so affected one of my uncles that he remarked, "The only time that kid hasn't got some kind of a revolver on him is when he is in the bath tub; then it's in the soap dish." As the years become history, the bias takes on the nature of that microscopical pit which appeared in your rifle a couple of seasons ago: it gets deeper and worse, until at present I am free to admit that the sight of a long, slender, graceful revolver fills me with more emotions than the rising generation receives from the cover design of Fleecy Stories. Not that I have always been faithful to my first love, you understand, for right now one of those villainously efficient instruments of the devil known as a Model of 1911 U. S. Army, with eight .45 Auto-riot shrapnel devices of the Remington's tucked away in it, lies under the pillow: but by special dispensation only. After blowing a hole in the bed with an automatic whose sear had developed a trick of jumping from the breech block at irregular intervals, my philanderings ceased and my bias deepened. Col. Colt's original idea is supreme.

So when my friend brought in one of those *genuine Colt Automatic* cartridge pistols, I told him three things: That he was an idiot to buy a German pistol; that he was a fool to buy an automatic pistol; and that, since he had bought a pistol that was both German and automatic, he had better carry it around in his hip pocket and give it a chance to blow his brains out. However, I'd see what could be done with it. It is a phenomenally simple pistol: the grip safety prevents pulling the trigger, and the firing pin spring holds the safety in place; otherwise it has no safety. It is simpler than that yet, for the firing pin is also the ejector. Considering that the hole in the bed had been made by a standard American arm, I had no business carrying my state of nerves into the new and second-hand store, along with this gun, and prospecting among the four cent cartridges for the make that would be almost efficient in this particular *"Genuine Colt Automatic"* cartridge hand grenade, but I did nevertheless. The lady whose husband owns the store graciously let me try any and all, as suited my pleasure.

Of course, it jammed.

"Maybe there is something wrong with the extractor?" said the lady whose husband owns the store.

Yes, possibly there was something wrong with the extractor; but it was that efficient-looking ejector that concerned me most, so I hoped that she didn't notice the marked similarity in attitude between my hair and a fighting cat's, and wished she were a gentleman: I felt like talking.

"You know," she continued, "I have trouble with the extractor on my Krag. It is all right when I use the .30-40 cartridges, but when I use .30-30's the shells blow up and I have to take them out with a buttonhook or something."

Title Defenders Sail

(*Concluded from page 14*)

ticularly prevalent among the old-timers.

You might compare this incident with another here in the East where an individual bought a Krag, and you know what bargains they are. Said Krag arrived in bad condition. The facts were reported to the Director of Civilian Marksmanship. Now, this individual, in response to the request for team contributions, writes a letter intimating broadly that if the N. R. A. will take steps to see that his complaint relative to the bargain Krag is handled to suit him, he may contribute ($1.00?) to the International Team Fund.

Ask the boys which side of the fence they prefer being on—the Liberty Bond side or the Bargain Krag side?

A Range Built on Cooperation

(*Concluded from page 8*)

competition is open to any rifleman in the State. Entries should be in by August 8th and all are cordially invited.

It is hoped at this time to perfect an organization that will hold annual matches including riflemen from the entire Pacific Coast and adjoining states.

There is no reason why the West should not successfully hold an annual classic to compare with the best the East affords. Any place in California will make it possible for members of the various clubs to attend from a score of states, that could not possibly compete in the East on account of distance and expense. This fair City even holds National Championships in Roque, and given an opportunity its hospitality will likewise be extended to the rifleman. And then in the matter of climate—we will admit that affair at Santa Barbara was a bit "unusual."

It might be added that the real burden of a near defunct club was carried by two old cranks with long years experience in rifle shooting, namely Jack Rains and Sewell Hall, the Club Secretary. The August shoot will be in the hands of these two men, assisted by members of the Encino Club of Los Angeles, Redondo, Santa Ana and neighboring clubs.

The Rubicon has been crossed and the club now anticipates many years of prosperity.

Holding Off in Hunting

By Ellerton James

I WAS very much interested in reading Commander Wilson's article on the "Lost Art of Holding Off" in the June 15th issue of THE AMERICAN RIFLEMAN, and it seems to me that the article in question is a most pertinent one.

Certainly in the hunting field one usually has not time either to shift a wind-gauge sight or shift the elevation and some of my friends tell me the conditions are the same in ordinary rough and tumble fighting. You have got to hold off to allow for the wind and you have got to hold high to allow for elevation.

Personally speaking, it would seem to be far better training if all our rifle teams on ranges up to say four hundred yards were compelled to shoot with fixed sights and then told to hold high or hold off to allow for wind and increased distance. Even at the longer ranges if you are trying to get a running animal, and the same must hold good for a running man, you hold off to allow for the speed at which the object is moving and you hold up to allow for the increased elevation. With regard to holding up rather than raising your sights the following story which was told to me a good many years ago by General Ripley of Vermont may be of interest. The General himself was a famous shot and during the War of the Rebellion a match was arranged between him and Burdan. I forgot just what the range was, but it was quite long for the rifles in those days. As Ripley told the story to me he and his orderly spent quite a long while in getting the exact amount of powder and the exact amount of bullet, and the exact elevation of his sight that would land the bullet plumb in the center of the black spot, because nothing but bull's-eyes counted. In order to get the bullet on he had to raise his rear sight quite a bit. Each man furnished his own targets, one target to one shot. Each man's orderly tacked the target on the tree or whatever else they were using as a back-stop, then the marksman fired, the target was removed, a new one substituted, etc. Well, to make a long story short, at the end of the match both men had cut the bull's-eye with every bullet, but Ripley's though the elevation was good were a little to one side of the bull's-eye both ways, while Burdan's were practically in the same hole a little high or a little low. The point of the thing is just here. On Burdan's targets there were two bull's-eyes and Burdan used his ordinary sights and held on the upper target. Ripley's extremely elevated rear sight in spite of all the care he took had canted his rifle a little bit and thrown it oft center.

And I have often thought with the extremely high elevation one has to give one's rear sights on long ranges, there is far more danger getting off the bull's-eye owing to canting than there would be if you held high.

Personally speaking, on my hunting rifles which are all sighted at two hundred yards, if I am targeting them before starting out at one hundred yards, I hold a little below the bull's-eye and I know the bullet will strike a little above the bull's-eye but as long as they are hitting in the same place I don't care. If they begin to wobble all over the target I know that something is wrong with me or the rifle. In the hunting field we all, I rather think, at ordinary ranges hold about at the middle of the "critter's" shoulder, knowing that if we underestimated the range, we would go a bit high and smash the backbone or if we underestimated it we would go a bit low and break a leg.

After all, all this whole business of target shooting with a rifle is simply and solely to develop men who can hit with certainty either game or hostile men, and as far as I have ever observed the target shooting game, it develops men who given time can shoot with deadly accuracy at known ranges but take those same men out on the South African veldt or Western prairies or Rocky Mountains and put them up against an animal that may be a hundred yards away or may be four hundred yards away, where they have got no time to get out range finders or do anything else but shoot and shoot quick, and they are far more likely to make a miss than is the man who has never shot a target at all but has spent his life in hunting game, and who never changes the elevation or windage on his sights but holds high or holds off according to the wind and elevation and has learned to estimate distance in various ways known to all who have given this matter in the hunting field any study. The late Theodore Roosevelt was about the best example of this accuracy in the hunting field and inaccuracy at the target. He himself has repeatedly told me he was no good when it came to target shooting, but I have heard repeatedly from men who acted as his guides in the West and men who have been with him, that he was almost uncannily accurate as a game shot.

I sincerely hope that in the near future our school of marksmanship will devote a great deal more time and attention than they have in the past to developing men who can shoot quickly and shoot accurately over unknown ranges at anything up to four hundred yards. It must be possible in many places in this country for the Government to acquire a few thousand acres of rough country and have set up over it in various spots, iron deer, iron men, iron animals of various kinds, and walk your training company about promiscuously over the country and when they step out from behind a tree or bush and see the deer, give the word to shoot. Use a stop-watch to time the firing, no shot fired after a certain number of seconds to be counted.

A trick I used to practice as a boy with a .22 is to walk past a prominent stone or stump without counting my steps, suddenly whirl around and shoot at the stone or stump. Of course, with a .22 this could not be carried out at over 75 or 100 yards, but up to this distance it certainly developed speed, accurate shooting and guessing distances.

Killing Power

(*Concluded from page 10*)

The law of ripples is not just little waves' laws. Ripples and waves have as different a set of laws as has America and Japan. The fast pill makes ripples in one animal, the big bullet waves.

Now hit an animal say six inches from the spine with a pill that sends its waves only four inches in all direction. Those waves—ripples, rather—pulp the meat but do not reach the spine six inches away, and the animal runs away. The big slow bullet does not pulp the meat but its force is used up in longer slower heavier waves, so to speak, and those waves break on the spine (Oregon) and that in turn stops all telephoning and telegraphing along the spine from that point on, so the whole machine from that point of the spine (see railroad) goes out of business at once, and the animal stops right then. Occasionally, after the telephone system has had time to readjust its wires and juice, the spine begins to transmit messages again, the animal gets up and goes right away. We have all noticed it, at least some of us have, when game was thick enough to draw conclusions from many kills.

Now at to the alleged air waves around a bullet. Have you ever tossed a newspaper out of a car window and watched said paper. I did it last Sunday to show a friend of mine, a catalogist, that the widely talked of theory about air waves around bullets was largely if not wholly guesswork to date. That newspaper not only kept abreast of our window, but twice even gained on the car speed for a window, or two. In short, are all the air wave lines we see in a photograph of a bullet made by air leaving the bullet? Or is the first air line, often nearly at right angles with the path of the bullet, the air wave getting out of the bullet's path, and the lines behind that first line the air waves coming back toward the bullet again?

Yesterday I was spotting at 100 yards for a Springfield. I watched a fly light on the paper, and just then a '06 bullet hit the paper within half an inch, not over two fly-lengths of that fly What did he do? Simply walked over and looked through the hole. The air wave of that bullet did not disturb that fly in the least, only about half-inch away from the bullet's patch. Well? I don't know. Who does? Between the newspapers out of the car window and that fly I have some doubts about certain sage solutions of the air lines in the photographs of a bullet in flight

Now apply some of this air guess work to what happens in an animal when that same bullet sets certain gases and liquids in motion, both directly and indirectly. We are now beginning to get into a dark gulch, so will stop right here for more light.

But this I do know, that the killing power of a bullet is half ballistics and half anatomy. One is meaningless without the other. Ballistics is the science of moving bodies, (bullets, railroad trains, birds, anything that goes from here to there) and anatomy is the construction of a living body. Killing power depends as much on the body as on the bullet.

THE NRA NEWS

Conducted by C. B. Lister

The Executive Officer National Matches, 1925

THE War Department has designated Colonel Alexander J. Macnab, U. S. Army, as Executive Officer, National Rifle Matches, 1925, to be held at Camp Perry, Ohio.

Colonel Macnab was born at Salmon, Idaho. He is one of the best known officers of the Army and is internationally recognized as an authority on rifle and pistol shooting.

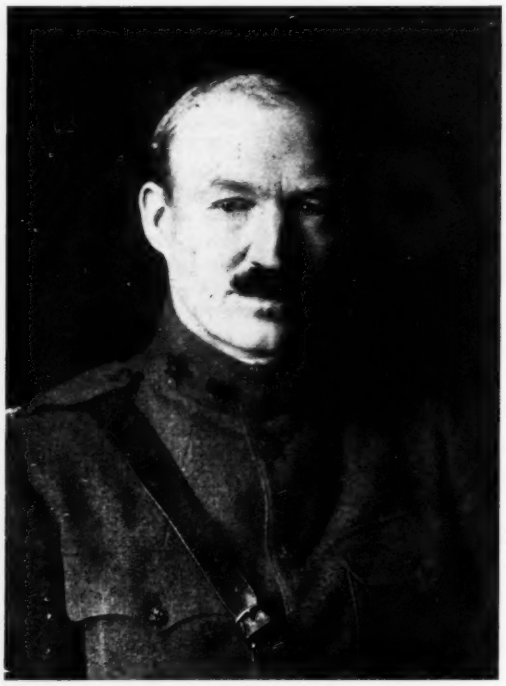
Previous to the World War, Colonel Macnab was known as one of the most expert rifle and pistol shots in the Army and was a member of numerous rifle and pistol teams of the Army.

As a result of his own experience, he developed a system of instruction in rifle marksmanship that was first used with excellent result in the 14th Infantry, his own regiment.

At the outbreak of the War, Colonel Macnab was assigned to the 83rd Division, of Ohio, West virginia, and Western Pennsylvania, at Camp Sherman, Ohio, and put this system into effect in this division with great success.

Upon reaching France he was placed in charge of the instruction of the troops of the A.E.F. in rifle marksmanship. He constructed the great rifle ranges in the vicinity of Le Mans, France, and supervised the instruction of the A. E. F. troops in rifle marksmanship at these ranges.

In 1919 he was in charge of the A. E. F. Small Arms Competition and the Inter-Allied Rifle and Pistol Matches at Le Mans, France participated in by all the Allied Nations of the World War.



Col. A. J. Macnab

On the return to the United States, he was stationed for some years at the Infantry School at Fort Benning, later in command of the 25th Infantry in Arizona and for the past two years has been on duty with the National Guard of New Jersey.

He is the author of "Rifle Marksmanship," used with great success in France, and which has been adopted by War Department for the instruction of the Army.

For his services in France in the training of troops in Rifle Marksmanship, Colonel Macnab was awarded the Distinguished Service Medal.

MICROMETER ELEVATIONS AT CAMP PERRY

We are advised by Frankford Arsenal that the elevations required for 1925 National Match ammunition will be the same as elevations for 1924 ammunition. These micrometer elevations are as follows:

200 to 300 yards, 2 minutes.
300 to 600 yards, 10 minutes.
600 to 1000 yards, 20 minutes.

CAPTAIN WOTKYNS APPOINTED DEWAR TEAM CAPTAIN

The announcement is made that Captain G. L. Wotkyns, Ordnance Department, U. S. A., has been designated by the National Rifle Association to act as Team Captain of the International Small-Bore Rifle Team in the 1925 competition for the Dewar Cup. Captain Wotkyns piloted the 1924 team to victory in this event with a new world's record score. He is well known and respected by the small-bore riflemen throughout the country, having been one of the first to take up the game when it was first introduced as a part of the National Match schedule and being one of the Regular Army officers who has consistently boosted the twenty-two.

* * *

FOURTH OF JULY SHOOT AT CAMP LOGAN

July 4th was celebrated at Camp Logan, Ill., by the shooters who could and did get there, in shooting a rifle match under Wimbledon Cup Match conditions. The weather was elegant, and except for an unsteady fifteen-mile wind that came around the edge of the woods at the left, everything was fine, thanks to Captain Tupper of the Infantry, and Captain Broche of the State Troops who provided us with target markers.

The shoot was featured by phenomenal shooting by the Infantry Team Squad, who demonstrated ability to hold their own with Capt. Joe Jackson's Leathernecks at long range. With an average of 95, including one 83, they made the civilians resolve to risk a little loose change on their friends in the National Match. The scores follow:

Name	Rifle Used	V's	Score
C. E. Nordhus	any rifle	12	100
Fred Johansen	any rifle	13	99
Lieut. R. E. Vermette	Service	13	99
Sgt. J. E. Jaynes	Service rifle	9	99
S. D. Monahan	any	8	99
Sgt. J. B. Sharp	Service rifle	14	98
T. G. Lively	any rifle	12	98
Capt. S. S. McLaughlin	Service rifle	9	98
Sgt. F. R. Moran	Service rifle	8	98
Corp. H. H. Jordan	Service rifle	7	98
Capt. L. S. Spooner	Service rifle	13	97
Capt. J. H. Kneubel	Service rifle	11	97
Lieut. F. S. Ross	Service rifle	11	97
L. A. Millbrook	any rifle	9	97
Capt. R. R. Tourtillott	Service rifle	7	97
Lieut. P. H. Kron	Service rifle	9	96
Sgt. Girkout	Service rifle	8	96
Sgt. M. A. Zavadsky	Service rifle	7	96
R. A. Brewer	Service rifle	7	96
Sgt. C. Hakala	Service rifle	8	95
Capt. W. Hibbard	Service rifle	8	95
Sgt. F. Platt	Service rifle	7	95
R. G. Weidenheim	any rifle	7	95
Helge Johnson	any rifle	6	95
F. W. Parker, Jr.	any rifle	6	95
Lieut. H. W. Barrick	Service rifle	9	94
Capt. J. P. Lyons	Service rifle	8	94
Capt. C. E. Lucas	Service rifle	8	94
Ernest Coler	any rifle	10	93
A. J. Davidson	any rifle	8	93
Capt. R. O. Miller	Service rifle	8	93
Walter Mott	any rifle	9	91
R. M. Thompson	any rifle	5	91
Mrs. Mc. Chesney	any rifle	5	90
Lieut. C. G. Rosaire	any rifle		89
Sgt. A. M. Boike	Service rifle	4	88
Capt. E. S. Hopps (121 Inf.)	Service rifle		88
A. F. Bronwell	any rifle		87
D. S. Seymour	any rifle	5	86
Roy Anderson	any rifle	4	86
Capt. McDonald	Service rifle	5	83
Frank Bronwell	any rifle		76
Sgt. Gorney (132 Inf.)	Service rifle		66
H. V. Roberts	any rifle		unfinished
E. L. Whitcomb	any rifle		unfinished

On July 5th a five-man team match at 100 yards, any sights, 20 shots, was fired at Fort Sheridan. Six teams entered, and the Hamilton Club of Chicago won the match by topping the Irving Park Club by one point. A very heavy mirage made spotting uncertain and several targets were returned with nine or eleven shot holes.

A 200 yard individual match with .22 caliber rifles, any sights, was also fired, but due to impatient and thirsty wives and children, many of the shooters had to leave before the match was fired. The scores follow:

Name	V's	Score	Name	V's	Score
C. E. Norhus	11	99	A. F. Bronwell	11	52
W. L. Cocroft	9	99	E. J. Moberg	3	92
A. C. Atherton	12	98	P. E. Hood	5	92
W. M. Garlington	12	98	D. Crumlish	3	91
R. Weidenheim	8	98	Miss Eckfelt	7	89
L. M. Felt	7	97	E. Coler	9	88
F. Karcher	11	95	W. Mott	7	87
Joe Crumlish	10	95	A. Esposito	1	68
W. Damon	6	95	L. Howell	5	61
J. R. Walker	4	95			

NATIONAL CASH REGISTER GETS GOING

Fifty women employees of the National Cash Register Company of Dayton, Ohio have placed their names upon the roster of the N. C. R. Rifle club organized by that concern, and which is one of the most recent clubs to affiliate with the National Rifle Association. The half-hundred prospective "Annie Oakleys" are reported to be most enthusiastic over this interesting pastime.

Although the N. . R. club is little more than a month old, the total membership is now 190, and some interesting "shoots" have been held. There are three ranges, 25, 50, and 100 yards, and the erection at a later date of a platform at 200 yards is contemplated.

This club has among its members Frederick B. Patterson, president of the company, and J. H. Barringer, its first vice-president and general manager. Both have long been active trapshooters and have taken up the rifle-shooting game with zest. It was, in fact, at the suggestion of Mr. Patterson that the Company club was organized, and he was the first to sign a membership card.

The grounds, backstop, and all equipment were furnished by the Company. The ranges are open to club members every afternoon after working-hours, and during the Saturday half-holidays. Instructors are kept on hand to assist beginners.

An interesting feature of these rifle ranges is that the firing points are abutments built out over what was formerly the bed of the Miami River. The backstop is also built over the old river channel.

Plans are now under way to provide an indoor range to be used during the winter. Shooting on the present ranges is limited to 22 cal. rifles; but there is available to this club on the grounds of Col. E. A Deeds, south of the city of Dayton, a range where high-powered rifles may be used.

G. L. Welch is president of the N. C. R. club, and A. A. Winters, secretary. Its activities are supervised by the N. C. R. Employees' Athletic Commission, appointed yearly by the Company.

OUTERS CLUB SHOOTS OFF TIE

Our regular club qualification course consists of the best target at 25, 50, 100 and 200 yards each six months. The highest is known as the club champion for the succeeding period. There was a tie the first six months of this year Laurence B. Holler, Jr. and William B. Lomas both having made possibles at all ranges. The tie was to be shot off on July 19th. We have a small club but most of the members and their families were on hand to witness the big event and big it proved to be. Our range is in a wild part of Westchester County and most of us hail from Mount Vernon, N. Y.

Of course we use scopes when we are in outside competitions but for our own competitions we are hard boiled and use iron sights, for our club qualifications we require iron sights so you see they both put over a pretty good performances to get all possibles. The shoot off had to be with iron sights also.

Late in the afternoon the match began, two of the other members shot along with them in order to give the real competitors a rest between strings. Holler made a possible at 25 yards, Lomas just missed his, the stalking horses trailed along. Holler puts up a 97 at 50 yards, Lomas the same. This time one of the fillers in slipped in a 98, then Holler takes a hand and gets back in the game with another possible at 100 yards Lomas gets a 98, the other two plug along with hopes. 200 yards and the last stage of the match Lomas gets forty-nine and it takes a magnifying glass to say that it was not a fifty. Holler just casually clicks off another possible and the match and the club championship is decided for another six months. 347 out of a possible 350 with iron sights, some shooting that and we think it is a record for competition. Laurence B. Holler Jr. will be engraved on the championship cup which is a beautv and if he gets it once more it is "his for keeps."

NOTICE

TO THE SMALL BORE RIFLEMEN OF AMERICA WHO WILL FIRE IN THE NATIONAL RIFLE MATCHES AT CAMP PERRY FOR A PLACE ON THE "DEWAR" OR INTERNATIONAL SMALL BORE TEAM

Eternal vigilance is the price of victory, and we must assume that our cousins across the sea are in no way idle or indifferent to the situation. Every year sees them taking from our book of rifle lore those features which have led us to success. As individual riflemen the British are our equals; as a machine they have yet to prove that every cylinder fires as adjusted; but the time is approaching when this condition will no longer exist, and in my opinion that time is near at hand.

The one outstanding feature of American success in contest of skill where teams are placed in competition is our insistence that the individual suppress all personal desires at star performance. He is a cog in a perfect mechanism which operates as a single unit. In other words we place our trust in rigid discipline tempered with horse sense. We shall as never before require your united co-operation that the "Dewar" trophy may not pass out of our hands, and I am confident that it will not if you can repeat the splendid work of last year with some additional pounds of pressure in the boiler, which I assure you is going to be necessary.

This famous competition now places all members of the winning American Team on the highly-prized International Rifle Team basis with right to wear the coveted brassard indicative of the highest skill known to rifle marksmanship. This brasard will in due season be issued by the National Board for The Promotion of Rifle Marksmanship.

We now have a "place in the sun," a place we have deserved for many years and which like all desirable things has only come through long and persistent efforts. LET US ONCE MORE MAKE THE GOOD FIGHT.

WOTKYNS, *Team Captain.*

SCORE BOOK CLOSED FOR ANOTHER OLD-TIMER

The following letter from Mr Roy F. Leighton, Range Officer of the Butte, Montana, Rifle Club, is published as a tribute to another old-timer whose target has been half-masted for the last time:

"I regret to inform you that the Butte Gun Club, formerly known as the Rocky Mountain Rifle Club, has lost one of its oldest and most valued members, Mr. Hans J. Holmes, who was instantly killed Wednesday, July 22nd, in an automobile accident while returning from his first fishing trip of the year. Mr. Holmes, from the time the club was first organized, was always a hard worker, spending all his spare time at the range doing the hundred and one odd jobs so necessary. He was a splendid shot both with rifle and pistol, being a member of the indoor team which held the indoor championship, 1910-11-12, and also a member of the Montana State team at Camp Perry, 1920. Mr. Holmes leaves a wife, two sons and a daughter, besides a host of friends to mourn his loss. We surviving club members can but wish that when the time comes for the Swabo flag to wave for us that we leave a record as clean as our departed friend and comrade, Mr. Hans T. Holmes, Executive Officer, 1906-1925."

OHIO RIFLE LEAGUE AT PERRY

The Ohio Rifle League has been casting around for some central range on which the league individual championship for 1925 could be fired shoulder-to shoulder. Acting on a suggestion from headquarters the League has decided to consider the N.R.A. Individual Small Bore Match which will be fired on Labor Day at Camp Perry as the official Ohio Rifle League Individual Championship. Practically all of the Ohio Small Borers will undoubtedly be on hand at Perry

BELLINGHAM TRIUMPHS IN WASHINGTON STATE

The rifle team of the Bellingham Rifle and Revolver Club by virtue of consistent shooting throughout the State Association Program took first place in the Annual League Matches for 1925. These matches were fired during the period from April 18th to June 7th, both dates inclusive and represented all types of firing with the Service rifle and the Free rifle. Each club fired on its own range and transmitted its score sheets to the State Secretary. Bellingham hung up a team total of 4166 out of a possible aggregate of 4525. They led the field in five of the seven matches being out-totaled the fifth week by Vancouver and Everett, and the second week by Seattle. Seattle finished second in Class "A" with an aggregate of 4097. The Arlington Club was high in Class "B" with an aggregate of 3995, while the Ranier Club of Seattle led Class "C" with an aggregate of 3844. The week's score and aggregate by team follows:

	1	2	3	4	5	6	7	Total Score
Class "A"								
Bellingham	366	476	474	490	709	932	719	4166
Seattle	353	484	473	487	703	922	675	4097
Spokane	348	469	458	485	680	931	708	4097
Vancouver	346	462	454	467	720	927	701	4077
Everett	346	463	358	482	710	921	680	4060
Class "B"								
Arlington	341	463	453	474	589	907	668	3995
Waitsburg	319	454	433	439	685	910	669	3909
Wenatchee	315	463	444	467	683	887	648	3907
Class "C"								
Ranier(Se'tl)	310	452	455	460	638	868	661	3844
Monroe	286	441	424	437	640	824	638	3690
Tacoma	321	408	399	433	676	810	631	3678
Olympia	261	435	428	392	685	873	593	3667
Yakima	285	428	436	472	577	848	611	3657
Moxee	223	423	368	405	521	798	549	3287

A total of 287 individuals competed in the various matches. The high individual total was turned in by G. E. Munson of Bellingham with an aggregate of 862 out of a possible 905. E. A. McGoldrick of Spokane was runner up with a total of 854. The success of these Washington State League Matches which, during the season, brought out an attendance of 287 men for record firing shows what can be done when a State Association is really up on its toes and gives the shooters the kind of matches that they want. There have, of course, been local disappointments when a few members have turned up at the range for a match, but taken as a whole the riflemen of Washington and particularly the directing heads of the Washington State Rifle Association including the hard working Secretary, Captain Paul J. Roberts, deserve real credit and may well feel that they have done a good job. Other states can learn much from Washington's experiences and we are going to try to get Captain Roberts to give us a resume of this year's work for the benefit of other State Associations already in existence or soon to be organized.

Gold medals were awarded to the winning team in Class "A," silver medals to the winning team in Class "B," and bronze medals to the winning team in Class "C." Mr. G. E. Munson received a gold medal for the State Championship and Mr. E. A. McGoldrick a silver medal for second.

* * *

ANNUAL SNOHOMISH COUNTY RIFLE SHOOT

The Annual Snohomish County Rifle Championship Match was fired Sunday, July 12th and was won for the third time by the Everett Rifle Team, Team No. 1 from that club hanging up a total of 657. Arlington was second with 606. Everett No. 2 was third with 579, and Monroe Rifle Club fourth with 528.

Conditions of the match called for teams of five, and while definite information concerning the course is not available, the scores would indicate that the course of fire called for ten shots at 200 yds. offhand and twenty shots at 600 yds. slow fire, the total team possible 750.

* * *

UNIVERSITY OF WASHINGTON WON INTERCOLLEGIATE

A re-check of the records of the Intercollegiate Gallery Rifle Championship, at the request of the University of Washington Team, indicates that the latter organization were winners of the N. R. A. Intercollegiate Championship for 1925. An error in addition on the club's record score card gave them a total of 2958, whereas their correct total was 2968. This relegates the University of Pennsylvania to second place.

* * *

NEWPORT NEWS LEARNS ABOUT RIFLE SHOOTING ON INDEPENDENCE DAY

The Kecoughtan Rifle Club of Newport News, of which Mr. C. C. Berkeley is president, came through as is usual with that club, in making the Fourth of July a rifle shooting day in Newport News. A large and enthusiastic crowd gathered on the club range for the matches, which opened at 3 p. m. and continued until 6 p. m. There were so many entries that a number of the events had to be taken off the schedule in order that the shoot could be completed during the afternoon. The matches were open to all comers without any charge, the prizes and trophies having been donated by the merchants and public spirited citizens of Newport News. There were two rifle matches for boys, one limited to youngsters between the ages of twelve and fourteen, both inclusive, and the other to boys from fifteen to seventeen years of age or any boys under fifteen who desired to compete.

The winner of the first mentioned match was B. Morecock, who won a bicycle tire as a result of his prowess. The runner-up was F. Culpepper, who took home a base ball bat with him. Morecock went right back in the match for older boys and won it, adding a baseball glove to his collection of prizes. E. Morecock, apparently a brother of the winner, finished second and received a base ball. In the "For Men Only" Match at 50 yards, Mr. B. Munikuysier took off first place and a fine ham. Mr Mosby was runner-up and received a pound of good tea.

The next match, open to all comers, was won by Mr. A. Armstrong, who recieved a box of cigars. Mr. Munikuysier was runner-up in this event and received a cleaning outfit complete with a jointed cleaning rod. In the Ladies Match, Miss Bland took high honors and received a silk-shaded boudoir lamp.

The match for police officers only, fired with the pistol at 25 yards, was won by E. Saunders, who received a flashlight to help him look around in the dark places. The All-Comers' Match was won by William Upton. Mr. Upton took home a pair of bedroom slippers.

There was also a special National Guard Match which was won by Private MacDonald. He received a broadcloth shirt, while Private A. Armstrong, runner-up took home 500 rounds of .22 caliber ammunition.

There are still three pistol matches and seven rifle matches for which prizes were donated for the Defense Day shoot. These matches will be fired at an early date under the same conditions of "everybody welcome." Mr. Berkeley reports that the Fourth of July shoot was a success from every standpoint.

* * *

A GOOD CLUB PROGRAM

The following program is printed not only as a matter of interest to the shooters in the vicinity of Arlington, Massachusetts, but as an example of the manner in which an active club schedules its matches at the start of the season and then sees to it that everyone in the locality knows about the match by broadcasting the program through the mail and in the local sporting goods stores and newspapers.

It should not be gathered that this program is to be considered as ideal for all clubs. The ideal program for Arlington might be anything but ideal for a club in some other section of the country. The important thing is to decide on a program, to advertise it and adhere to it. It will be noticed that there is a liberal sprinkling of open matches, league matches and handicap matches throughout the program, as well as a special field day, which was held on July 18th.

Saturday, July 4th, 10 a. m.—Open shoot, 200 yards, .30 caliber, metal sights only; 10 shots prone, 10 shots standing. First, second, third and fourth prizes. Entrance fee $1.00 Re-entry 50c.

Saturday, July 11th, afternoon—Eastern Mass. Rifle Legue Match, Arlington vs. Middlesex at Lincoln, Mass.

Saturday, July 18th, 10 a. m.—Field Day of the Essex County Sportsman at Haverhill, Mass. Trap, revolver and rifle shooting. 200 yards, offhand, metal sights. Entrance fee 50c and reentry; also fly casting. Range on Amesbury road.

Saturday, July 25th, afternoon—Eastern Mass. Rifle League Match, Arlington vs. Braintree at Arlington.

Saturday, August 1st, afternoon.—Club and friends shoot, small caliber (.22), metal sights only, 100 yards, 10 shots prone, and 50 yards, 10 shots standing. First, second and third prizes. Entrance fee 50c. Re-entry 25c.

Saturday, August 22nd, afternoon. — Club handicap shoot, 200 yards .30 caliber, metal sights only. 10 shots prone and 10 shots standing. Entrance fee $1.00. Re-entry 50c. Each shooter naming handicap. Prize highest scratch score. First, second prizes, Class A. First and second prizes, Class B.

Labor Day, September 7th, 10 a. m.—Mass. State Handicap Meet, open to members only, of clubs affiliated with the N. R. A. 200 yards, .30 caliber, metal sights only. 10 shots prone and 10 shots standing. Each shooter to name his handicap. First, second, third and fourth prizes. Entrance fee $1.00. Reentry 50c.

Saturday, September 12th, afternoon — Club Championship Handicap Shoot. 200 yards .30 caliber, metal sights only. 10 shots prone and 10 shots standing. First and second prizes, Class A. First and second prizes, Class B. Entrance fee $1.00. Re-entry 50 c.

All shoots to be conducted under the N. R. A. rules. Members are at liberty to use the range at all times, with the exceptions of Sundays and when the club is using the range for matches, by complying strictly to the club rules, which are posted in the club house on range. You will also find in the club house the club bulletin which we hope each member will read. Keys to the club house can be obtained from the secretary at 25c each.

BISLEY SCHOLARSHIPS

The following extract is quoted verbatim from the British N. R. A. Journal of June this year. Bisley is to the British what Perry is to the American rifleman. Bisley lacks one thing that Perry has to offer the Tyro. That is the School of Instruction. If the British Clubs and Canada Associations find it worth their while to award Bisley scholarships to their Tyros, how much more worthwhile should the American Clubs find it to award Camp Perry scholarships to Tyros?

In England the holder of the scholarship goes to Bisley and into competition with the best shooters of the nation. In America the holder of the Perry scholarship would receive at least a week of instruction and coaching by the best instructors possible to get together on the range, and then a week or two weeks of actual experience in competition firing.

What effect would it have on your club if the Tyros were given to understand that one of them was to receive a Perry scholarship? It is not too late to put this idea over for this year, although the time is limited. Certainly now is the time to start thinking about it for next year. If your club cannot carry the load, maybe you can interest enough public spirited citizens to help you carry it, or possibly two or three clubs not too far distant from one another could pool their funds, and by a process of elimitaton, select one man from all the clubs interested and award to him the coveted Perry scholarship.

We have a Perry scholarship from the Sea Girt Small Bore Tournament and we have two from the Chicago Small Bore Tournament, but there seems to be no good reason why the more aggressive clubs and State Associations should not award Perry scholarships of their own.

"Bisley Scholarships"

"In the current programme and rule book of the Glamorganshire Rifle Association, we notice that this old association, is again offering for competition a Bisley Scholarship, value £7 15s., amongst its Class C competitors. We believe that it was one of these scholarships that brought Pte. Henry to Bisley last year, and his success must have advertised them considerably in the Principality. In addition to this scholarship there are two other offered by the Welsh XX Club to its tyro members. These latter are value at £5 each, and pay for King's and St. George's, and all Class C entries, and return fare.

"Amid all the talk about the necessity for encouraging new blood in rifle shooting, it is good to see such practical manifestations of faith. The Londoner, who shoots year in, year out, on the Bisley ranges, is rather apt to overlook the good work that is done by others who have not his advantages. We have had occasion, once or twice, to draw attention to the forward policy of the men of Lancashire in this matter. The Lancashire idea is, to educate the territorial in competition shooting, with the idea that his success and love of the game will induce him to become a centre of enthusiasm in his company and regiment. That is one way of tackling the problem of getting new blood. The Welshman takes a young and promising shot to Bisley and hopes that he will cover himself with glory, and will come back and preach the good news that 'Bisley is well worth while.' The result of that policy last year must have turned out excellently for Welsh, and for other parts of the kingdom as well. Pte. Henry did remarkably well, and when he had that other brilliant youngster, Burke of Canada, winning the coveted Gold Medal, it should not be so difficult to persuade the youngsters that it is well worth their while to try their luck at Bisley."

FRANKFORD ARSENAL WINS SMALL BORE TEAM CHAMPIONSHIP

The Frankford Arsenal Rifle Club, of Philadelphia, Pa., by virtue of consistent team work, defeated the Peerless Rifle Club, of Cleveland, Ohio and thirty-four other teams for the National Small Bore Team Championship in the postal matches just completed. The high man on the Frankford Arsenal Team turned in an aggregate of 397 and the low man 393. The high man on the Peerless Team turned in 399, but the low man could do no better than 386, which tells the whole story in a nutshell.

As is usual with old line shooting organizations, the Frankford Arsenal Club used a variety of equipment, each shooter having learned that it pays to pick out what fits him best and stick to it.

Portland, Oregon finished a good third with a team aggregate of 1962, just three points behind the Peerless Club. The following bulletin gives the names of the various individuals comprising the three high teams, together with the equipment that they used, in addition to listing the names and scores of the other teams which completed the match.

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OUTDOOR SMALL BORE MATCHES

OFFICIAL BULLETIN NO. 1.

Interclub Championship Match No. 9

No. 1.	**Frankford Arsenal R. C., Phila, Pa.**	**1974**
L. J. Miller	Winchester 52, Fecker, U.S. N. R. A.	397
R. H. Betts	Winchester 52, Fecker, U. S. N. R. A.	394
N. G. Stabler	Springfield 22, Win-5-A, U. S. N. R. A.	393
C. H. Johnson	Pope-Ballard, Fecker, U. S. N. R. A.	396
C. S. Hogue	Winchester 52, Win-5-A, Palma	394
No. 2.	Peerless Rifle Club, Cleveland, Ohio	1968
D. Baker	Baker Hi Speed, Fecker, Palma.	399
A. E. Hart	Hoffman, Fecker, Palma.	396
E. Johnson	Hoffman, Fecker, Palma.	395
W. C. Anderson	Hoffman, Fecker, Palma.	392
J. Hine	Hoffman, Fecker, Palma.	386
No. 3.	Portland Rifle Club, Portland, Ore.	1962
H. F. McDonald	Winchester 52, Fecker, Precision 200.	398
H. J. Gripe	Winchester 52, Fecker, Precision 200.	395
E. E. Brown	Winchester 52, Fecker, Precision 200.	394
J. E. Helm	Winchester 52, Win-5-A, Precision 200.	388
F. P. Studholme	Winchester 52, Win-5-A, Precision 200.	387
4.	McCook Field Rifle Club, Dayton, Ohio.	1952
5.	Hillsboro Rifle Club, Hillsboro, Ohio.	1951
6.	Quinnipiac Rifle Club, New Haven, Conn.	1946
7.	Perth Amboy Rifle Club, Perth Amboy, N.J.	1945
8.	Pasadena R & R Cl. Team 1, Pasadena, Cal	1940
9.	Pasadena R & R Cl. Team 2, Pasadena, Cal	1932
10.	Bear Rock R. C. Team 1, Germansville, Pa.	1929
11.	Chicago Rifle Club, Chicago, Ill.	1921
12.	Wilkes-Barre R. C., Wilkes-Barre, Pa.	1919
13.	Ames Faculty Rifle Club, Ames, Iowa.	1918
14.	Mound City Rifle Club, Webster Groves, Mo.	1914
15.	Whiting Rifle Club, Whiting, Iowa.	1908
16.	Schenectady Rifle Club, Schenectady, N. Y.	1902
17.	Louisville Nat'l R. C. Team 1, L'ville, Ky.	1900
18.	Mass. Rifle Ass'n. R. C., Melrose, Mass.	1900
19.	Cleveland R. C. Team 1, Cleveland, Okla.	1898
20.	Spang Chalfant R. C. Tm 1, Pittsburgh, Pa	1895
21.	Franklin Rifle Club, Franklin, Pa.	1895
22.	Claremont R. C. Team 1, Claremont, N. H.	1893
23.	Livermore Rifle Club, Livermore, Colo.	1890
24.	Evansville Rifle Club, Evansville, Ind.	1885
25.	Cleveland R. C. Team 2, Cleveland, Okla.	1885
26.	Bear Rock R. C. Team 2, Germansville, Pa.	1880
27.	Holtwood Rifle Club, Holtwood, Pa.	1877
28.	New Britain R. C. Team 1, N. Britain, Con.	1874
29.	Spang Chalfant R. C. Team 2, P'burg, Pa.	1866
30.	Louisville Nat'l R. C. Team 2, L'ville, Ky.	1862
31.	Claremont R. C. Team 2, Claremont, N. H.	1844
32.	Jacksonville Rifle Club, Jacksonville, Fla.	1836
33.	Spang Chalfant R. C. Team 3, P'burg, Pa.	1806
34.	Spang Chalfant R. C. Team 4, P'burg, Pa.	1804
35.	Associated Rifle Club, Coalinga, Calif.	1566
36.	New Britain R. C. Team 2, N. Britain, Con.	1565

"AD" TOPPERWEIN MOVES ON

"Ad" Topperwein, of San Antonio, Texas, who started out in life as a cartoonist, and who is now the world's greatest exhibition rifle shot, will soon move on to Nebraska, Wyoming, S. Dakota and Iowa.

Topperwein began his 1925 tour on the Pacific Coast and since March he has been in California, Washington, Oregon, Idaho, North and South Dakota, Texas, Kansas, Oklahoma, Minnesota, Wisconsin, Wyoming, and before the year is over he will have shot in more than thirty of the States. During the month of August he will appear in Iowa, Minnesota, South Dakota, Nebraska and Wyoming.

Recently Topperwein gave an exhibition before the police chiefs of Texas in Dallas, at which there were four thousand person. The average attendance is one thousand. Topperwein shoots in about 250 cities a year and travels about 30,000 miles. His exhibitions are given for the purpose of stimulating interest in rifle shooting.

Topperwein holds every record for exhibition rifle shooting, endurance and otherwise. Many of his feats are marvelous and beyond description. Telling of them in advance causes many people to smile. They doubt what they read. There is nothing you read about Topperwein, however, that is bunk. The one sure way of getting the right angle is to go out and see the Texan give his exhibition.

In some cities Topperwein will remain but one day, in others he will remain two days. While he is in this city he will be glad to talk with sportsmen and give them advice on the use of guns and ammunition. Topperwein knows his subject thoroughly.

The exhibition will be as free as the air.

Here is the Topperwein itinerary August 3rd to September 2:

August 3, Sioux City, Iowa; Aug. 4, Sheldon, Iowa; Aug. 5, Worthington, Minn.; Aug. 7, Sioux Falls, S. D.; Aug. 8-10, Madison, S. D.; Aug. 11, Huron, S. D.; Aug. 12-13, Rapid City, S. D.; Aug. 14-15, Chadron, Nebr.; Aug. 17-18, Casper, Wyo.; Aug. 20, Scottsbluff, Nebr.; Aug. 22-23, North Platte, Nebr.; Aug. 24-25, Kearney, Nebr.; Aug. 26-27, Grand Island, Nebr.; Aug. 29, Bonesteel, S. D.; Sept. 1-2, Sac City, Iowa.

Local rifle clubs should take advantage of Topperwein's exhibitions to work out a booster campaign of their own. Get in touch with the local Winchester dealer, who will be more than glad to cooperate with you in putting on a program which should add members to the roll and dollars to the treasury.

* * *

400 YARD STAGE IN NATIONAL MATCH

Civilian riflemen who intend to participate in the National Matches this Fall are advised that the three hundred yard rapid fire stage has been eliminated from the National Matches. A four hundred yard rapid fire stage has been substituted therefor. This will be fired upon the "B" target, with a twelve inch "V" ring on the regular twenty inch bull's-eye. All hits in the "V" ring will count five. Hits in the black but outside of the "V" ring and hits in the inner or four ring will count four. Other points scored as before.

REAL CO-OPERATION

Commencing Sunday, July 5th, the Rainier Rifle and Revolver Club at Seattle, Washington, started a plan which should certainly work out to the mutual benefit of all concerned, including the individual riflemen of the club, the club itself, and the National Rifle Association. Rainier is going to award to the member making the highest percentage of the gross total for the two successive Sundays' shooting an annual membership in the N. R. A. No scores will count unless they are fired on two successive Sundays. If the high man is an annual member of the N. R. A., he will be given a year's subscription to THE AMERICAN RIFLEMAN. To quote from the Rainier Bulletin:

"If he has both these treasures he is well fixed and the next high man takes the prize. If you win either of the above prizes, you then step out and give the others a chance. Winning a prize does not bar you from further shooting, but the prizes are allotted on the basis of ONE TO A CUSTOMER. Here is a chance to get a double dose of fun out of your shooting, for any shooter who does not get a real kick out of being an N. R. A. Member or reading THE AMERICAN RIFLEMAN is dead from his watch both ways."

One of the principal reasons for loss of interest on the part of club members is the poor line of communication which exists between headquarters here and the men on the club firing line. Too few of the clubs maintain bulletins which are sent to club members weekly, advising them what is going on, not only in their club, but in the shooting world at large. There is only one way for the club member to keep in touch with the shooting game as a whole, and that is through reading THE AMERICAN RIFLEMAN and through receiving the programs, price lists, and bulletins which are sent out by the N. R. A. direct to individual members.

The Rainier Club accordingly, under its new scheme, is serving the three-fold purpose of increasing the interest of its own club members, of granting a worth-while but very inexpensive prize, and of supportng the N. R. A. in a practical manner. Let us hear that more clubs have adopted the Rainier plan.

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WASHINGTON STATE ASSOCIATION ANNUAL MATCHES AND ELECTION

It is regretted that a combination of delayed mail and crowded space has prevented previous publication of the results of the Washington State Competitions and election, but they are worth publishing, even though the matches were fired as far back as May 31st.

The competitions were held at Fort George Wright. Capt. Geo. A. Lockhart, of the Fourth U. S. Infantry, acted as Executive Officer.

The Match called for ten shots slow fire at 200 yards, ten shots rapid fire at 300 yards and 20 shots at 600 yards. Teams of six competed in the team match. The scores made by team members were also counted in the Individual Match, which was fired at the same time by the unattached competitors. Eleven full teams were entered.

The Washington National Guard got away to an eight-point lead over the Fourth Infantry at the 200 yard stage, and while the Regulars succeeded in reducing this lead to five points at 300 yards rapid fire, the National Guardsmen again forged to the front at the 600 yard stage and won the competition from the Regulars with a margin of twenty points.

The Spokane Rifle Club, after getting away to a bad start at the short ranges, turned in a team total of 561 at the mid-range, to pull up to third place with a score of 1097, thirteen points behind the Fourth Infantry. The team scores were as follows:

Place	Team	Score 200 yds. S.F.	300 yds. R.F.	600 yds. S.F.	Total
1.	Washington National Guard				
2.	4th Inf., Ft. George Wright	262	294	554	1110
3.	Spokane Rifle Club	256	280	561	1097
4.	Everett Rifle Club	259	276	557	1092
5.	Bellingham Rifle Club	255	274	562	1091
6.	Wenatchee Rifle Club	254	284	537	1075
7.	Reserve Officers, Spokane	241	284	533	1060
8.	Vancouver Rifle Club	248	277	536	1053
9.	Yakima Rifle Club	253	266	522	1041
10.	Waitsburg Rifle Club	243	255	498	996
11.	Pullman Rifle Club	238	270	468	976

The high Individual score was also turned in by a member of the Guard Team, Lieutenant L B. Jacobson, who hung up 194 over the course. Jacobson, however, had not entered the special individual match, so that he lost the opportunity to add another medal to his collection. E. A. McGoldrick, of the Spokane Club, and Captain Paul J. Roberts, N. R. A. State Secretary, who was firing as a member of the National Guard Team, both turned in 193 in the Individual Match. McGoldrick's 43-50-100, however, outranked Roberts' 47-49-97. Third place in the Individual went to Alex Hetland, of the Everett Club, with a score of 192. There were seventy-four individual competitors.

Following the matches, the annual election of the Washington State Rifle Association was held, and the following officers were elected: President, Mr. George W. Jackson, Everett, (re-elected); Vice-President, Mr. John M. Curry, Yakima; Secretary, Captain Paul J. Roberts, Camp Lewis, (re-elected); Exec. Officer, Mr. W. A. Schwartz, Vancouver; Derictors, Mr. E. G. Park, Bellingham, Mr. Alfred Gfeller, Wenatchee, Mr. John Mack, Moxee.

It was decided to hold the 1926 conference, competition and election at the Army Range at Vancouver, Washington, and it was decided to separate the Individual and Team events entirely and to devote two days to shooting the program instead of one.

It was voted to alter the present system of Inter-club matches, so as to provide that the team to which would be awarded the title and medals of State Champion would be decided at the annual shoulder to shoulder competition. The present series of correspondence matches was to continue in effect but bronze medals, suitable engraved to indicate the nature of the competition, would be substituted for the present gold, gilt and silver medals. The medals of the superior quality are to be awarded at the shoulder to-shoulder match. Teams that have not affiliated with the Washington State Rifle Association and taken part in the series of weekly interclub matches, conducted by mail and telegraph, will not be eligible to participate for these medals in the annual competition, but may compete for other trophies and money awards as at present. The Individual State Champion will be determined at the shoulder-to-shoulder match.

A step taken at this meeting which should be carefully considered by every State shooter was the promise of closer coordination of small bore outdoor and gallery firing throughout the State in the N. R. A. Postal competitions. State championship medals for teams and individuals are awarded in certain of these matches. Heretofore Washington has repeatedly had the requisite number of entries with some to spare, but not in the same or proper match, and as a result these special state medals could not be awarded. The Washington Clubs plan to pay more attention to this in the future and to work, through their State Secretary, to see that entries are coordinated.

* * *

MIDDLESEX LEADS EASTERN MASSACHUSETTS RIFLE LEAGUE

By virtue of their victory of June 20th over the team from Lynn, the Middlesex riflemen are leading the Eastern Massachusetts Rifle League with a clean slate. Middlesex has won all five of the league matches fired to date. They defeated Lynn on June 20th, 284 to 260. On the same day the U. S. M. A. A. Team defeated Arlington, 265 to 253, and the Braintree Guards downed Reading, 264 to 254. This was Framingham's week to idle.

The League standing to date follows:

	Won	Lost
Middlesex	5	0
Arlington	3	1
U. S. M. A. A.	3	1
Braintree	3	2
Reading	1	3
Framingham	0	4
Lynn	0	4

* * *

CROSSMAN FAMILY IN LIMELIGHT AT SHOOT

The Crossman family roped off with the three top places in the weekly shoot at the Schuetzen Park by the Los Angeles Rifle & Revolver Club.

The scores follow:

Captain Crossman	145
I. O. Gardiner	138
Mrs. Crossman	131
Ned Cutting	131
E. E. Steininger	129
D. F. Kellmer	120
Frank Verbeck	112
L. F. Reed	111
E. D. Neff	111
C. E. Dreyer	109
H. Lee	108
E. M. Nutting	84
B. H. Paul	73

This match was fired on the International target reduced for 200 yards, giving a ten ring 2 4 inches in diameter, and a nine ring 4.8 inches in diameter. Crossman, in winning this match, registered ten tens and five nines.

* * *

PATERSON, NEW JERSEY, OPENS POLICE RANGE

According to a full column article in a recent issue of the Paterson, New Jersey "Evening News," the Police Department of that city, under the leadership of Police Commissioner George Christie, has installed a new police range. It is planned to have every man in the department undergo a qualification course, the city furnishing the necessary ammunition for practice and record firing. The Evening News has already donated a large silver cup for annual competition by the police officers, and it is to be expected that with the support of the newspapers, the merchants will also get in behind the idea.

An effort will be made to have a team from the Paterson Department on hand at Perry, in order that these newcomers to the organized shooting game may see how it is done.

Conducted by Lt.Col. G. C. Shaw

Shooting for Qualification

EVERY civilian rifle club member should shoot over the qualification course and try his utmost to qualify. If possible, he should become an Expert Rifleman but if conditions are against him, he should try to become a marksman at least. Riflemen are classified as Expert Riflemen, Sharpshooters, Marksmen, and unqualified in accordance with the excellence of their scores made in record firing. Appropriate insignias are issued by the D.C.M. to all civilian rifle club members who make the necessary scores. Every club should make an effort to fire one of the prescribed courses so as to qualify as many of its members as possible.

A number of the clubs have reported that they have qualified every member, and now are trying to improve the shooting of the individual so that all of their members may gain the coveted designation—Expert Rifleman. It is the aim of every combat organization in the Regular Army to qualify at least 80 per cent of its members. Very few fall below this standard nowadays and quite a few report 100 per cent qualification. This can be accomplished as the result of hard work. This goal should interest each and every one of our rifle clubs.

Before attempting to fire for record every rifleman or pistol shot should take a comprehensive course of preparatory instruction and a certain amount of preliminary firing on the target range. Many excellent shots have fallen down over the qualification course due to failure to observe this. The few extra points that many shooters need to make a higher qualification can be obtained by a bit of position, trigger squeeze, and bolt manipulation exercise. All the information necessary for the rifle shot may be obtained by reading and following closely the course of instruction outlined in Training Regulations 150-5. Any of the apparatus needed may be made by anyone and used in his back yard or on the range.

After becoming thoroughly familiar with the use of the rifle through a close application of the principles previously mentioned, everyone will be anxious to put his knowledge to the test. This test may be made by firing for qualification over one of the prescribed courses. This compares to the final examinations in schools to test the knowledge of the student. The well prepared student welcomes examinations, while the other kind generally fears them. The final results obtained are generally in direct proportion to the effort expended. The courses of fire are all shown in Training Regulations 150-10, as well as all the rules and principles to be followed.

These rules are subject to the modification that while the soldier has only one chance to fire for qualification each year the civilian rifle club member may fire as many times as he wishes. However only one complete course may be reported, and only one qualification badge will be awarded during any calendar year. Only one badge in each grade will be issued to any firer, and no badge for a lower qualification will be issued after a shooter has made a higher qualification. Credit will be given for a requalification bar, one of which is issued for each three qualifications in any particular classification.

Although the rifle club member may shoot for record more often than the soldier, he must be just as good a shot as his military brother in order that he make the required scores. The latest requirements, effective May 20, 1925, are as follows:—

Course	Expert	Sharpshooter	Marksman
A	306	290	240
B	228	216	185
C	230	218	190
D	236	224	195

The club president should designate the course and the date. He may designate any course that the club members desire and the target range will permit. Course "A" requires a range with 200, 300, 500 and 600 yard firing points; Course "B," 200, 300, and 500 yards; Course "C," 200 and 300 yards; while Course "D" may be fired entirely upon a 200 yard range. Range and pit officers should be designated and pit details for marking targets arranged. The prescribed procedure for record practice as shown in Training Regulations 150-10, Sections V and VI, should be followed to the letter. Range and pit officers need not be the president or secretary of the club. Clubs may have as many officers as they wish, and it is suggested that there be a number of range and pit officers so that the burden of this duty will not fall too heavily upon a few.

Upon completion of the course fired, the scores made by each member should be carefully recorded. At the end of the firing season, these scores should be submitted to the D.C.M. on record sheets (ODCM Form 2) which will be furnished upon request to this office. Only the scores for one complete course should be reported for each member firing, and the course fired must be shown. Insignia of qualification will be sent to the club secretary for presentation to the office of the D.C.M. The name of the person qualifying will be filed in the records of this office for future reference.

Last year over ten thousand civilian marksmen qualified as Expert, Sharpshooter, or Marksman over the prescribed courses. All of these should make the same or higher qualification this year and many more should qualify for the first time. A record of having all of the members qualified should be worked for by all clubs. A rifle club of trained shots will go a long way towards helping the shooting game in your community, to say nothing of the great assistance it is in a position to render our country if necessary.

* * *

SEND IN YOUR REQUISITIONS

Requisitions for supplies for the fiscal year 1926, beginning July 1, 1925 are now being approved. It is urged that all clubs send in their requisitions without delay. Before requisitions can be approved, the clubs must be in good standing with the N.R.A. and all returns and reports of firing required by this office must be up to date. All shipping tickets for previous shipments must also be in this office.

* * *

KRAG CARBINES EXHAUSTED

As published in the July 1st issue the supply of Krag carbines has become completely exhusted. There is a large supply of Krag rifles on hand however. The price of these is $6.00.

* * *

SPRINGFIELD PRICES CHANGED

Everyone is advised that the prices quoted in the N.R.A. price list of June 15th, for Springfield rifles and parts are incorrect. The prices have been changed on all Springfield rifles and parts except sporters. Obsolete rifles, revolvers, and ammunition prices are correct. Anyone desiring to purchase these rifles or parts list their requirements and write the D.C.M. who will quote prices. A new N.R.A. price list will be issued.

* * *

SEND IN SHIPPING TICKETS

Many clubs are failing to send in a signed copy of each shipping ticked received from the arsenals. When this signed shipping ticket is not received it causes this office a great deal of extra work. These shipping tickets are necessary to keep the records of the various clubs straight, and must be mailed to the Director of Civilian Marksmanship, 1635 Tempo No. 5, Washington, D. C. as soon as property listed thereon is received. Failure to do this will make it necessary for this office to disapprove future requisitions.

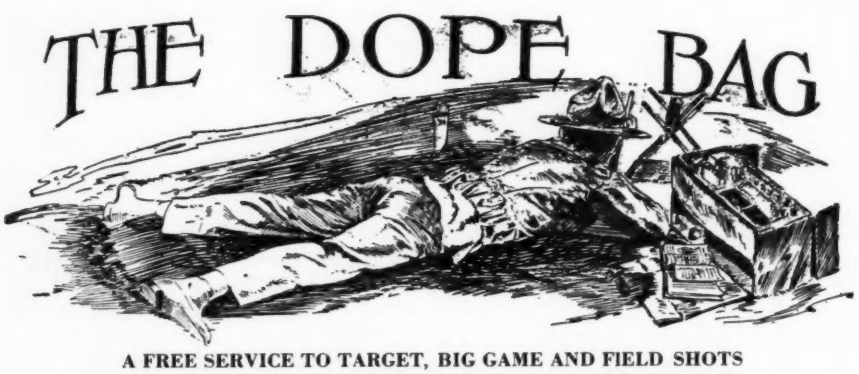
* * *

Be sure to remember that the D.C.M. and a large part of the personnel of his office will be at Camp Perry for the National Matches and the Small Arms Firing School from August 20th to September 20th, any orders should be sent in before then to avoid a delay of over a month.

* * *

NO SPORTERS AVAILABLE

No more orders for the cal. .30 Springfield, model 1903, sporting type, (Springfield "Sporter"), will be taken at the present time. The production of these rifles has been delayed so that no definite information as to the time of delivery is available. All orders received for this rifle have been forwarded to the Armory, and it is believed that those orders placed prior to July 1st may be shipped about August 1st. This cannot be guaranteed however. Notice will appear in this column when a new lot of these rifles are available. No further orders will be taken until immediate delivery can be assured.



A FREE SERVICE TO TARGET, BIG GAME AND FIELD SHOTS
ALL QUESTIONS BEING ANSWERED DIRECTLY BY MAIL

Rifles and Big Game Hunting: Major Townsend Whelen **Pistols and Revolvers: Major J. S. Hatcher**
Shotgun and Field Shooting: Captain Charles Askins

Every care is used in collecting data for questions submitted, but no responsibility is assumed for any accidents which may occur.

Getting Ready for the St. Louis Schuetzenfest

By Townsend Whelen

FOR some time, I've been thinking about writing you for some information on reloads, but something has always interfered with my plans, so I haven't had the time or something.

What I want to ask you is this: Next August there will be a big Schuetzen affair held in St. Louis, and as far as I know now, they will only allow low power rifles to be used, so I was thinking if you know of any suitable load to be used in a .30-'06 barrel, to give real accuracy at 200 yards.

I have measured up some bullets that Jim Howe gave me, and find that they measure around .311 inch which I think are too large to use in a barrel which measures only .3081 inch. In believing so, I may be wrong, but experience has taught me that a barrel should really be made for the bullet to fill, and no more, and in this case, I can make a new barrel just for the occasion, however, I have also been thinking I should make myself a 32-40 barrel and fit it to a Ballard action, and use set-triggers, because these matches will be offhand, and I believe that I can bring back the bacon with proper equipment.

If I could only use my heavy barreled Springfield I'd be all set, because she will do consistently two inches and under, at 200 yards, muzzle and elbow rest, but how it would perform with a reduced load, and soft bullets, I do not know, and because I don't know anything about reloading, I wanted to consult someone who is posted on the subject.

If you will kindly give me some dope on the above subject, I assure you I shall appreciate it, and will perhaps be able sometime to do you a good turn. E. J., Cleveland.

(*Answer by Major Whelen*). I have your letter of May 2nd and am very glad to have heard from you. I presume that the schuetzen affair at St. Louis will permit only lead bullets, not jacketed bullets, even when loaded to low velocity, so we will discuss the matter on this presumption.

I have done about as much work as any man with .30 caliber rifles and lead bullets, starting in at this as long ago as 1899. It has been my experience that generally one can get very good accuracy and reliability with such loads, but not what you and I would call gilt edge accuracy. Thus I have found that in .30 caliber Krag and Springfield I had no trouble at all in developing loads which would shoot steadily into 3 inches at 100 yards or 6 inches at 200 yards, or perhaps just a little closer, with an occasional fine group. The trouble is that only the fine groups get published and mislead us.

The best results that I have obtained in both Krag and Springfield have been with Ideal bullet No. 308241—154 grains, 1 to 10, sized and lubricated .311 in Ideal lubricating machine. I used this bullet, and this size because I had all the molds and tools.

The size .311 was adopted by the Ideal Mfg. Co., because when they adopted it the bullets were being used mostly in the regular issue Krag rifles which had a groove diameter ranging from .308 inch to .311 inch, with an average of about .3087 inch. Afterwards this size proved to work well in the Springfield also, and that size has been pretty well standardized for all .30 caliber barrels. But it won't work in the better hand-made .30 caliber barrels because the chambers are usually too tight at the neck to admit cartridges containing .311 bullets. It is generally conceded to be necessary, and I believe it to be so, to have the bullet larger than groove diameter if good work is to be done with a reduced load and lead bullet in high power rifles. But I do not think that it is necessary to have the bullet .003 inch larger. If the bullet can be fitted to the individual rifle I think that one .001 inch larger is all that is necessary, and that such a bullet would perhaps do better work than one .003 inch larger than groove diameter.

Last year Mr. E. T. D. Francis, an experienced Canadian rifleman of Crawford Bay, British Columbia, reported to me that he had had remarkable accuracy in a Springfield rifle, with a reduced load and lead bullet. He used Bond Bullet No. A311870—150 grains, cast 1 to 10, sized to .311, Western cases expanded at the muzzle with a .309 inch plug, Dominion No. 8½ primers. 10 grains weight of du Pont Shotgun Smokeless Powder. He fired 6 groups at 100 yards, getting 1.6, 1.5, 2.0, 1.3, 1.4, 2.3 inch groups —average 1.8 inches.

I presume that you are familiar with the work of Squibbs, Miller, Pope, and Hession in reduced loads in .30 caliber rifles at the Metropolitan Matches in New York in the Spring of 1922. These were described in THE AMERICAN RIFLEMAN at that time. Briefly these four had different loads which shot well enough indoors for them to average all shots in the 2" circle of the small bore target at 100 yards. This must have meant that 1½ inch groups were the regular thing with these loads. If you do not have issue of that date on hand I will be glad to have it copied and sent to you. Their loads suggest possibilities for you to work with in your heavy barrelled Springfield rifle.

Lead bullet reduced loads in high power rifles are fine for those who want to do a lot of shooting, but who must exercise economy in the price of their ammunition. But not having to exercise such economy myself I gave up the use of such loads about seven years ago because I did not find them as accurate as jacketed bullets and reduced loads of power. I think you always get a more uniform bullet in jacketed bullets, than the very best lead bullets that skilled molders can turn out. In addition to the jacketed bullet better resists the little deformities that the throat and bore of almost every rifle gives to bullets. The better the jacketed bullet the better it should shoot, and I think that probably you could get most excellent results from your heavy Springfield by using a reduced load, say, of the 180 grain Remington Palma jacketed bullet, and a light charge of HiVel, or a heavy charge (about 25 grains) of du Pont No. 80 powder, provided that the conditions at St. Louis allowed jacketed bullets at reduced velocities.

In the .32940 I do not think that you can get better results than those obtained by Dr. Hudson with his throated barrel and his enlarged base band bullets. These experiments were fully described in the later Ideal handbook. If I remember rightly Dr. Hudson used to get about 3 inches at 200 yards from these loads, but by reason of their higher velocity and better ability to buck the wind, he was able to do better shooting with them at 200 yards than he could with the older Pope muzzle loading, black powder rifles, although the latter were good for almost 2 inches at 200 yards in perfect weather conditions.

In lead bullets, .30 caliber, I should think that the best promise would be in the Pope bullet which Hession used in the Metropolitan Matches in 1922.

A NEW STOCK

I HAVE a Model 52 Winchester with the old style stock on it and would like to know if one of the new improved stocks would fit this gun. If so would it be much trouble to change them, and what would be the approximate cost? W.J.S., Waterloo, Iowa.

Answer (by Major Whelen). The new stock for the Model 53 Winchester will fit the old type rifle. The stocks are interchangeable. You can most probably make the change yourself, or any gunsmith can change them for you in a few minutes. I do not know the price of the new stock. Write to the Winchester Repeating Arms Company for the price.

LIGHT LOADS

I HAVE purchased from Belding & Mull some lead bullets for the .30-'06 weighing 100 grs. blunt point. What charge of du Pont No. 80 shall I use with these and to what range will this load be sufficiently accurate for target use?

With 18 grains No. 80 and the 150 gr. service bullet in the Springfield, what is the longest distance at which accuracy may be expected? Have you the ballistics of this load? J. S. G., St. Paul, Minn.

Answer (by Major Whelen). Perhaps 9 grains of du Pont No. 80 powder might do fairly well behind a 100 grain Belding & Mull cast bullet in the .30-'06 cartridge, but really du Pont No. 80 powder is too slow a burning powder to do well behind such a light bullet. I think you will get better results with 3.5 to 4.0 grains of Bull's-eye powder. Four grains of bull's-eye should give a muzzle velocity of about 950 f.s., and should make quite a good light load for 25 yard work.

With regard to the load of 18 grains of No. 80 powder and the 150 grain full jacketed service bullet. The muzzle velocity is 1508 f.s., and the breech pressure 17,620 pounds. The farthest that I have tried this load is 300 yards, but the accuracy at this range was so good that I should not be surprised to see it do good work at 500 yards on a calm day. Of course the weight of the bullet and the low velocity indicate that it will be quite sensitive to wind changes, and on a windy day it will be considerably excelled by a load with higher velocity.

SCOPES AND RELOADS

WILL you kindly tell me about what the velocity would be of an 87-grain bullet in the .250-3000 Savage behind 16 grains of No. 80, also the same bullet behind 20 grains of No. 80? I have found in this particular rifle that 16 grains of No. 80 gives far better accuracy than 12 grains. Also that I can find no difference in the accuracy of the 100-grain and 87-grain and the 86-grain Western bullets. The 86-grain is of course the .25-20 bullet. They all shoot alike but of course the .25-20 is much cheaper. What would be the largest charge of No. 80 powder that would be safe in the .250-3000 and also in the .30-'06?

I note that you have never tried the boat tail bullet with light loads. I have shot several thousand most always with light loads. The flat base averages a little better than the boat tail but not enough to amount to anything. And to be very frank about it, I can't get anywhere with F. A. bullets. The best that I can get out of them on an average is two at 100 yards, which is not very good. (This is with a machine rest.) The Remington International Ammunition does much better 1 inch at 100 yards. I also have a lead load in a heavy barrel that averages 1 inch at 100 yards.

What can you tell me about the new Fecker combination rear sight and spotting scope. Is it practical to use the same scope on a number of rifles. I want a scope for target shooting and for shooting crows. A scope is of no use for other hunting here as it is too brushy . What power of scope would be suitable for the above work, and what kind of mounts would be the best to use?

I believe Fecker asks $5.00 for this scope without mounts. Is it much better than his other type of scopes? I have never used a scope on a rifle so anything that you can tell me will be appreciated. J. L. D., Ranier, Minnesota.

Answer (by Major Whelen). In the .250-3000 Savage cartridge twelve grains of duPont No. 80 powder, and the 87-grain Western bullet gives M. V. 1500 f. s. I imagine that 16 grains of this powder with the same bullet would give about 1950 f. s., but a load greater than 12 grains has never been chronographed. I imagine that you are getting pretty close to the maximum charge of No. 80 with your 20-grain load. It is a characteristic of No. 80 that when the maximum load is exceeded it seems to give high pressure in the base of the cartridge case, swelling the case at the base but without the pressure gun showing an excessive pressure. I am interested to know that you have gotten good results with the 86-grain .25-20 bullet, owing to the cheap price of this bullet.

I think that the scope which Fecker calls his "combination telescope sight and spotting scope," is his ten power. Under favorable light conditions one can see .22 caliber bullet holes very nicely at 100 yards. It is also a very suitable scope for target shooting, particularly small bore shooting, allowing almost errorless aim. However, owing to the high power it is very necessary to focus the glass most carefully for the particular range, and also to remove the parallax for the particular range. Both of these are easily accomplished by following the directions which Fecker sends with the glass. This glass should be a great help to an experimental rifleman. It is really a little more of a small bore rifle telescope than for high power rifles. The eye relief is rather short, consequently the eye must be held quite close to the eye-piece, and one must watch himself when using this telescope on the .30-06 rifles that he does not get a bad jab in the eye from the recoil. Slip the open end of a rubber thumb stall over the outside of the eye-piece, letting it project an eighth inch to the rear as a protection.

Fecker scopes are best placed in Winchester mountings, securing both mounts to the barrel, the rear mount up against the receiver, and the front mount forward on the barrel so that there is 7.2 inches between the centers of bases. Then one graduation either in elevation or windage will be equivalent to half a minute of angle, or ½-inch adjustment at 100 yards. All this is on the Springfield and similar rifles. To determine if the Fecker is suitable for any particular rifle figure on the length of the tube of the scope, where you will have to place the mounts, and where the eye-piece will come with this combination, and see how this agrees with where you wish to hold the eye in aiming. Also figure on the opening of the breech bolt. Often with Fecker or Winchester scopes you have to push the telescope forward to open the bolt, and then you pull it to the rear again, up to its stop, before firing. The stop is adjusted on the barrel of the scope so that when the scope is pulled to the rear for shooting the stop will come up against the front of the forward mounting, its tooth engaging in the cut in the front of the mounting.

AUTO OR SIX SHOOTER?

I AM completly at a loss to decide which of the following revolvers to purchase. You mentioned the .45 New Service as being very desirable. One dealer claims the .45 Smith & Wesson, Model 1917, adopted by the U. S. Army and standard of the California National Guard, being superior on account of double locking device, holding cylinder in better alignment. Also the finish is superior to Colt's. I know by experience that the Colt .38 as constructed, gives good service, and this no doubt should be the case in a heavier caliber of the same make. Another dealer mentions the S. A. as the most dependable of any revolvers. It may be so. My experience is confined to revolvers below and including .38-40. Any heavier caliber is new to me, and would have to get used to it. I own one .45 caliber Automatic Colt Pistol. It has never jammed so far, but misfired four times out of 100 shots fired, three times when cocking the hammer. The defective cartridge fired, therefore the trouble must be with hard or deteriorated primers. Ammunition is quite old, Frankford Arsenal Nov. 8th, 1911, but is cheap and good for practice. A friend of mine, Captain in the 160th Infantry, California National Guard, advises me to trade in the pistol for a .45 Smith & Wesson. I do not readily accept this advice. I like my .45 Automatic, and as the trouble lies with the ammunition I use, it is not giving this arm a fair deal. I have at hand several boxes of cartridges of various makes, which I will try out and judge for myself. I have examined several heavy Colt revolvers and find them as follows: .38-40 and .45 Colts National Guard, are quite heavy, look rugged, and like all double action revolvers, a long pull to revolve the cylinder and cock hammer; .45 Smith & Wesson, 1917, is of course lighter in weight, good finish, shoots .45 Auto Pistol cartridge. I do not know whether or not this cartridge develops more velocity and energy in revolver, same having 5½-inch barrel. Would appreciate your opinion. .45 Single Action has a good hang and grips, quite a slow ejection, that rod business, looks rugged, slow to shoot for one never having handled it, but even so, it may be fast enough for what use one gets out of most any arm. It's mostly only a hobby anyway, this owning of guns. It is also quite expensive these days, but it is interesting to handle them. G. H. M., Pasedena, California.

Answer (by Major Hatcher). You state that your dealer recommends the Smith & Wesson Model of 1917 as having been adopted by the United States Army, and as being the standard weapon of the California National Guard. It may be of interest to you to know that the Colt New Service .45 was also adopted by the United States Army as long ago as 1909, and was called the Model of 1909. It was superseded in 1911 by the Automatic Pistol.

In 1917 when the War broke out, the Government did not have enough Automatic Pistols and accordingly the Colt Company rechambered the New Service Model to take the Automatic Pistol cartridge and called it the Model of 1917 and Smith & Wesson rechambered the .44 Military to take the automatic pistol cartridge, and it was also called the Model of 1917. The clips that made this possible were invented by Smith & Wesson.

When the first Smith & Wesson revolver chambered this way was presented to the government, I was stationed at the Springfield Armory, and I personally made the test that led to its adoption.

These Colt and Smith & Wesson 1917 revolvers were purchased by the Army during the entire war simply because there were not enough Automatic Pistols. At the close of the war these revolvers were placed in reserve, and the Automatic Pistol is the standard arm now used.

The Government will sell to N. R. A. members, through the Director of Civilian Marksmanship, the Colt Model 1917 for $14.50 and the Smith & Wesson Model 1917 for $16.15. These guns sold through the D. C. M. have seen service, but have been cleaned and repaired and are in excellent serviceable condition; some of them being just like new.

The Smith & Wesson is better in finish, but is not superior in any other point in my opinion.

The Single Action Army Colt is more subject to breakage of interior parts than either the New Service or the Model 1917.

In choosing the Model 1917, it may be of interest to you to know that the velocity of the Automatic Pistol cartridge in the 1917 revolver is about 12½ foot seconds less than it is in the Automatic Pistol; the difference being due to the loss of gas just forward of the cylinder.

I believe that your trouble with misfires that you had with your Automatic Pistol, is due to the fact that the ammunition is fourteen years old. However, should you find that you get misfires with recent ammunition, this can be overcome by putting in a stronger main spring.

AN OLD MAUSER

I HAVE a J. P. Sauer Model Mauser purchased in 1912. This rifle is in perfect condition as far as I can see, except the barrel in slightly worn from much use (not abuse).

Will it be safe to use the strictly modern cartridges as used in the Springfield in this rifle? What is your personal opinion of the Mauser as made by Sauer before the war? L. P. J., Mercer, Pennsylvania.

Answer (by Major Whelen). It is perfectly safe to use your .30-06 Sauer Mauser with any of the heavier hunting or Palma cartridges put out in this caliber in recent years. A pre-war Sauer Mauser is an excellent weapon, accurate, reliable, and handy. It is one of the best rifles in the world. It would not pay to change this rifle for any other so long as it remains good.

GAME LOAD FOR THE ROSS

I WANT to do a little deer shooting and want to know where I can get and what is the best or usually preferred cartridge for use in the Ross .303. I have been shooting quite a bit with my rifle using the regular 174 grain, full jacketed cartridge, but it has occurred to me that perhaps it is not the best for deer shooting. Would you please tell me about the cartridge to use, and where I could get them the easiest? L. M. M., Duluth, Minn.

Answer (by Major Whelen). I think that the .303 British cartridge with 215 grain, soft nose bullet as made by either the Remington Arms Company or the Western Cartridge Company, is the best big game ammunition for the .303 Ross rifle.

I think that this ammunition with 215 grain, soft nose bullet is a better killer and a more reliable ammunition than any of the .303 British Mark VII cartridge with 174 grain bullet, which is more of a military and target cartridge than a hunting one.

HEAVY STUFF FOR THE .45 COLT

IN the March 1st issue of THE AMERICAN RIFLEMAN, you told R. D. T. of Long Island, N. Y. that the heaviest load for the .45 Colt was the Remington black powder load, velocity 910 ft., sec. energy 460 ft. lbs.

I would like to get some of that make, if these figures are true. You have stated several times before that the velocity of the .45 Colt black was 825 ft. sec. and the energy 386 ft. lbs. so I thought there might have been a mistake in writing those figures. How should I have loaded .45 black shells to get 910 ft. sec. velocity? I notice in a Remington catalog that they load .45 Colt black in 40, 35 and 28 grain charges and Winchester also loads 38 and 28 grain loads. What are the velocity and energy figures on these loads?

It might interest readers of THE AMERICAN RIFLEMAN to know that Wm. R. Buckhard, 143 East 4th St., St. Paul, Minn., will for the sum of $2.50 re-chamber the Smith & Wesson caliber .45, Model 1917, that he sells, so that they will use .45 Colt D. A. cartridges. E. S., North Hibbing, Minn.

Answer (by Major Hatcher). The velocity of 910 f. s. given in the March 1st issue of THE AMERICAN RIFLEMAN, is correct for the Remington Black Powder load for the .45 Colt. The Remington Company is the only firm loading it this high in velocity; the average being 825 feet, and this is why I have given some correspondents the latter figure as the standard velocity for the Black Powder load.

The velocity and energy depend on several things, including the granulation of the powder, the make of powder, the weight of the bullet, ect.

In general, a load of 34 grains of F. F. G. Black will give approximately 825 f. s., which is the standard load.

To force the velocity right up to the maximum with safety, really requires factory facilities for testing the various lots of powder and developing a load that will be within the safe maximum pressures. It would take about 40 grains of F. F. G. Black to bring your velocity up to 910 f. s.

SHORTS IN THE L. R. CHAMBER

I AM using a .22 Savage N. R. A. rifle bored for .22 long ammunition and would like to know if it would do any harm to the gun to practice with .22 short. F. M. B., Orbisonia, Pa.

Answer (by Major Whelen). It is probable that the occasional use of a few rounds of .22 caliber Short Lesmok cartridges in a barrel chambered for the .22 long rifle cartridge will do no appreciable damage, but the continued use of .22 Short cartridges in such a barrel will eventually score and injure the chamber, and render the barrel inaccurate and unsatisfactory. I would never fire a single .22 Short cartridge in a good .22 Long Rifle barrel of my own. Also the short cartridge in such a barrel gives only mediocre accuracy.

In addition .22 caliber cartridges loaded with smokeless powder should never be used, but only those loaded with Lesmok or Semi smokeless powder. The smokeless cartridges are less accurate, less powerful, and when they are used I know of no way of cleaning which will prevent the barrel corroding.

TROUBLE IN GENERAL

I AM inclosing in a package attached to this letter a fired .30-06 shell, shot in an 1895 Model Winchester, serial No. 58648, the primer of which is badly set back and extended around the firing pin, it seems to me, but want to make sure about it, before doing anything about it, so am coming to you for advice.

Do you consider this dangerous? The same thing happened with Western 220 grains. The gun is one I just traded for and its firing pin hole looks slightly enlarged. A primer once caught on the firing pin, that is, stuck to it but was not punctured. What in your judgment would be the best way to remedy this defect if it does exist, send the gun to Winchester, or are the parts interchangeable and could I do the work myself?

What do you think of taking the action of the .25-20 Savage sporter and rebarreling it with a match barrel for close match shooting at target distance one hundred to two hundred yards?

What size groups could I get from such a rifle?

I have a Colt slide action gun which I can't get shells for. It says .44 caliber on the barrel, only a .44 Colt and .44-40 won't go in over two-thirds their length. Could you give me the caliber? C. D. H., Cashmere, Wash.

Answered (by Major Whelen). The cartridge case which you sent me seems to indicate a defective firing pin, or an enlarged firing pin hole in the face of the breech bolt of your rifle. It ought to be sent to the makers for correction. Perhaps you may be able to fire four or five hundred rounds with the rifle in its present condition without trouble, but eventually, when the breech bolt gets a permanent set back from much firing, you may have a serious accident with that firing pin.

I hardly see how a match barrel could be placed on a .25-20 Savage sporter, for the barrel and receiver are made all in one piece. Nor do I think that a heavier barrel would help the accuracy much. You cannot expect gilt edge accuracy from these old-fashioned cartridges which have so much of the bullet seated inside the case. In this caliber the most accurate cartridge is the low pressure smokeless cartridge of Winchester make. It will give about three inch groups at 100 yards in a good rifle. Only use Winchester make of cartridges. Other makes all contain a powder which eventually pit the barrel badly despite the best care.

I do not know exactly what you mean by "Colt slide action gun." Do you mean a rifle or a revolver? The Colt Lightning Magazine Rifle, slide action, used the .44 C.L.M.R. cartridge, very similar to the .44-40, the cartridge being made by the Winchester Company. Some of the old Colt revolvers took the .44 Colt Center Fire cartridges, containing 23 grains of Black powder, and a 210 grain bullet. Neither of these cartridges have been made for 25 years, and they never will be made again. Some old gun stores in the West might have a box or two still on their shelves, but these cartridges would most probably be so old as to be worthless.

RELOADING THE .35 WHELEN

AS I load most of my own ammunition, particularly for target work with reduced loads, I notice in the last communication from du Pont that they recommend the No. 17½ powder for a full load loading. What I would like to know, is this 17½ powder the best thing for 220 grain bullet .30 06 Springfield rifle, also would like to know the number of grains of this same powder, if it is correct to use, for the 35 Whelen on the new 270 grain bullet, for this rifle and also where can I get these 270 grain bullets and also unprimed cases for the 35 Whelen.

Also would like to know the number of grains of powder to use for the new Remington Express Springfield Ammunition for the 220 grain Mushroom bullet and where can I get these 220 grain Express Mushroom bullets? N. E. B., N. Y. City.

Answered (by Major Whelen). In the Springfield rifle I think that du Pont No. 17½ powder is the most satisfactory grade to use with 229 grain bullets. With these bullets the regular charge of this powder is 44.7 grains weight, giving a muzzle velocity of 2,225 f.s. The maximum charge, which should never be exceeded, and which should be used only in new cartridge cases, never in war time cases, is 46.8 grains, giving a muzzle velocity of 2,350 f.s. If I were you I would split the difference and load 45.5 grains.

Any sporting goods store can obtain the 220 grain Remington Express Mushroom bullets for you, or you can order from the Modern Bond Corporation, Wilmington, Del., who I believe, keep them in stock. The Remington Company discourages the ordering of components direct from their company on account of the correspondence entailed on very small orders, but are glad to supply these components through sporting goods houses. You can also use the new Western 220 grain soft point bullet, which is equally as good as the Remington, but I don't believe any better, getting it through R. F. Riggs, Western Cartridge Co., East Alton, Illinois. The above charges of No. 17½ powder are suitable for either of these bullets.

Owing to the characteristics of the .35 Whelen cartridge, this cartridge does a little bit better work with du Pont No. 15½ powder than with No. 17½. The proper charge of No. 15½ powder for use with the new 275 grain bullet made by the Western Tool and Copper Works of Oakland, Calif., is 62 grains, giving a muzzle velocity of approximately 2,250 f.s.

I imagine that No. 17½ powder could also be used with almost equal results, using a charge of about 50 grains with the 275 grain bullet. Probably neither the velocity or the accuracy would be quite up to the above charge of No. 15½ powder, but in ordinary shooting I doubt if anyone could tell the difference.

Both the above charges are rather husky. I have been getting fine results at the target from the .35 Whelen rifle, using the 275 grain bullet, with a powder charge of 47.5 grains of du Pont No. 15½ powder. The recoil is moderate, and the accuracy fine. The muzzle velocity is about 2,025 f.s. It should be a fine load for deer, and for moose also in Eastern forests.

The 275 grain .35 Whelen bullet made by the Western Tool and Cooper Works, can be obtained from Griffin and Howe, 236 East 39th Street, New York, N. Y. I regard it as the best large game bullet for the .35 Whelen.

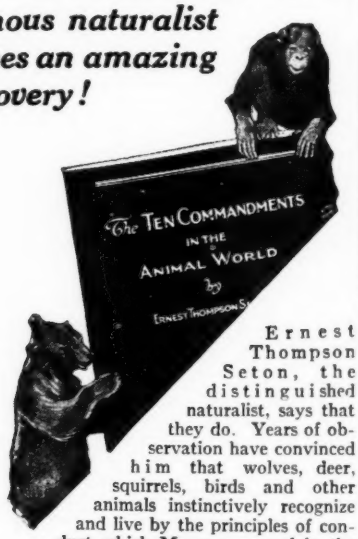
A MAUSER ACTION FOR THE .250

THERE is one point upon which I should like some information. I am a great admirer of the Savage .250-3000 cartridge, but I don't like the Savage bolt action rifle. In my opinion it is a very crude bit of work. The design may be good, but the workmanship is bad. I have been trying to get hold of a short Mauser action ot handle their cartridge and the best price I can get from the importers in New York is about forty-two dollars, which is absured. Can you suggest any other action? Would the Springfield receiver and bolt work? How does the Savage lever action work out with this load? I should think that there would be considerable spring to the bolt. P.S., Auburn, N.Y.

Answer (by Major Whelen). The importer of Mauser actions has a monoply of the matter, and has thus put the price up to a most exorbitant one. I am afraid nothing can be done about it as he has it tied up so that these actions can be imported into this country only by him, or rather the German firms are able to sell only to him. As an example, the firm of Griffin & Howe have been obliged to pay $35.00 for short Mauser action being the best for the .250-3000 Savage cartridge. The combination makes one of the best and most useful small rifles in the world, particularly when the action is fitted to a Niedner barrel. I think that the Springfield action could be fitted with a .250-3000 Savage barrel, but the action is much longer than need be, and it would be necessary to fill in the rear of the magazine, probably with an aluminum block. The Niedner Rifle Corporation, Dowagiac, Michigan, could probably do all this work for you in connection with the fitting of one of their barrels.

Do Animals Obey the Laws of Moses?

Famous naturalist makes an amazing discovery!



Ernest Thompson Seton, the distinguished naturalist, says that they do. Years of observation have convinced him that wolves, deer, squirrels, birds and other animals instinctively recognize and live by the principles of conduct which Moses expressed in the Ten Commandments. Mr. Seton has collected from the pages of his notebooks actual instances in which animals showed by their actions that they were governed by the seven great "thou shalt nots" and the three great "thou shalts." And now these fascinating observations have been published in an absorbing little book which is full of meaning for everyone who believes that the whole creation is governed by an All-Wise Intelligence.

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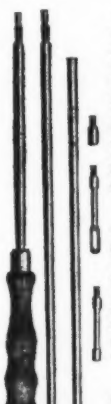

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When saturated with oil, prevent rusting or pitting—perfect protection for any gun. One oiling lasts a year. For shot guns or rifles, 60 cents; revolvers, 30 cents. State gauge or caliber wanted.

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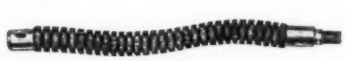

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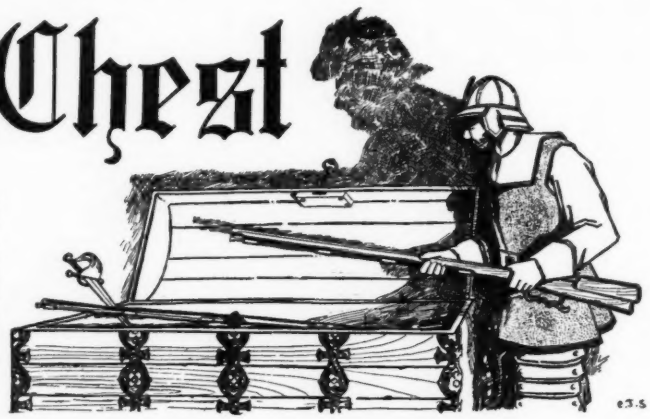

TERMS

THE uniformly excellent returns from advertisements appearing in the classified columns of THE AMERICAN RIFLEMAN make it a most satisfactory and productive medium for the disposal of surplus shooting equipment, or the acquisition of special types of firearms.

Free Insertions. **Each subscriber is entitled to one insertion of one-half inch, when his subscription is paid for one year. It is necessary only to write or print the text plainly, noting thereon the date subscription was paid. These advertisements will appear in the first available issue and should be in publication office two weeks prior to the following publication date.**

Paid Insertions. **Non-subscribers or those who have already made use of the subscriber's privilege may take advantage of these columns at a cost of $1.00 per inch or part thereof. No advertisement for less than $1.00 accepted. Advertisements will be set in 6 point solid. They should be in the publication officer two weeks prior to the time appearance is desired.**

We have fought the fanatics to draw this round. Let us prepare for an intelligent offensive NOW. Ship your stamp and SHIFT WITH THE HOUSE OF SHIFF the GUNMAN. North Woodstock, New Hampshire. X

FOR SALE—New and slightly used Graflex, Kodaks, lenses, binoculars, telescopes, Zeiss, Goerz, Hensoldt, Busch. Reasonably priced. Good firearms taken in trade. National Camera Exchange, 29 S. 5th St., Minneapolis, Minn. Y

.250-3000 SAVAGE BOLT ACTION, shot perhaps thirty times; absolutely perfect inside and out, with four boxes of hunting ammunition and three adapters for .25 Stevens. First money order $40.00. S. P. Wright, Sec. Cap City Rifle Club, 509 N. Grand Ave E., Springfield, Illinois.

SHIFT WITH THE HOUSE OF SHIFF, THE GUNMAN, N. Woodstock, N. H. This is our 54th year, and best. I have never shipped a gun I did not personally back EXCEPT NEW. DIRECT to your order. I never carry because they are cheap but only because they are RIGHT. One charge. One price to ALL. If you have not shipped your stamp, if you are not fighting fanatics. If we have to smuggle our guns as you do a drink THEN SHIFF'S NEW YEAR'S MESSAGE to YOU is that it serves YOU WELL AND RIGHT. A

WANTED—Percussion Colts; 9 inch barrel, six shot, caliber .44 cylinder 2½ long, square back trigger guard, length about 16 inches. Leading lever, round cylinder stops. No trigger guard, folding trigger, round cylinder slots, marked, "Patent Arms Mfg. Co., Patterson, N. J. Colts Pat." Square back trigger guard, no loading lever, round cylinder slots, cal. 31. Write for photos. Examine your percussion revolvers also ask your friends to let you see theirs, if any answer the above descriptions write me, I pay highest prices. I am a collector, not a dealer. FLINT LOCK PISTOLS: Lock plate marked "Harper's Ferry 1806 or 1807 Eagle and U. S." Marked "U. S. Springfield 1818." Lock plate marked "U. States under Eagle also S. North Berlin, Conn." S. H. Croft, 23rd & Market Sts., Philadelphia, Pa. B

FOR SALE—About 200 firearms including some rare and desirable items, such as 1807 Harpers Ferry pistol, S. North Berlin pistol, 2 Duelling sets, 35 Priced Sale Catalogs, Catalog Lowell Collection, "Simeon North First Official Pistol Maker," Copies No. 2 & No. 4 "Stock & Steel," Jenks Navy rifle, Greene under hammer oval bore rifle with bayonet, Percussion revolvers, carbines, rifles. J. C. Harvey, 880 Main St., Worchester, Mass. C

SHIFT WITH THE HOUSE OF SHIFF THE GUNMAN, N. Woodstock, New Hampshire. The last price list for 1925 will be out in a few weeks. Our stock is very complete and summer prices hold till October first. We are stealing second base from the fanatics. If you can read and FIGHT you will get your moneys worth if you care to ship your stamp. D

FOR SALE—New guns at discount to members N. R. A. Also number of used guns, priced right. No list, say what you want. Member N. R. A. Earl J. Russell, Monmouth, Illinois. E

FOR SALE—S. & W. .32, 4½ inch barrel. Police Model, square butt, absolutely new, $20.00. One Colt's .32 4 inch barrel, police positive, new condition, $19.50. S. & W. .38, 6 inch barrel, square butt, new condition, $24.50. One Marlin shotgun pump, 20 gauge, 30 inch barrel, absolutely new, $30.00. Colt's Auto. 25 cal., $11.00. Savage Automatic .32 cal., $12.50. Hunting coats, size 36, brand new, $3.50. Samuel Kates, 2000 South St., Phila., Pa. F

FOR SALE—Ithaca Single Barrel Trap Gun, 12-gauge, 34 inch barrel, Grade 7E beautifully engraved. Fancy Walnut Stock 14x1½x2, straight grip, Silver's Recoil Pad, handmade sole leather case. All in perfect condition, cost around $450.00. First check for $250.00 takes the outfit. R. H. Burkhart, 5 E. 53rd St., New York City. 193

FOR SALE—Plain Ballard action for .22. Double set triggers, full finger lever, very good walnut stock, Swiss butt plate, $20.00. Two fine handmade .22 caliber single shot target pistols, new. Write for description. Inclose stamp. WANT—Gilding metal bullets, cal. 30, 170 gr. flat base or B. T. Du Pont No. 16 Powder. Ideal Mould .32-40-319247 Krag rifle barrel, new, perfect inside, Springfield barrel and action, perfect star-gauged, .25 cal. Mauser Auto. H. G. Stark, 336 Stedman Place, Monrovia, Calif. 194

FOR SALE—One .410 gauge double bbl. shotgun, Crescent Gun Co., in factory condition, $20.00. One 1897 Marlin .22 cal. Take-Down, canvas case, first class condition, $18.00. One 20 power telescope, brass mounted, $10.00. H. F. Barrett, 90 West Broadway, New York City. 195

FOR SALE—Model 19, .22 Savage N. R. A. Match Rifle; Lyman receiver sight No. 42; Lyman interchangeable bead and ivory front sight; sling attachments and sling. Also all original sights as issued with rifle. Perfect condition inside and out. Price $20.00. Barberry House, Clinton, Oneida County, N. Y. 199

FOR SALE—Stevens Offhand 8 inch barrel, better than new as it has oiled stocks, flat top rear sight and hand smoothed easy trigger pull, $10.25 delivered. Colt's .45 S. A. Army 5½ inch barrel, fine condition, inside of barrel perfect, hand smoothed trigger pull, $13.50 delivered. Springfield carbine .45-70, good condition, accurate gun, $4.50 delivered. W. C. Scott, London, 12 ga. hammer gun, stock 13½ by 2¾, inside of Damascus barrels in fine condition, bored for quail shooting, cost over $100.00—will take $25.50 delivered, including canvas case and cleaning rod. Barrels 27 inches. H. N. Spencer, 1601 Railway Exch. Bldg., St. Louis, Mo. 197

FOR SALE—L. C. Smith high grade hammerless, 10 ga. 30 in. Damascus, full and modified, very good, $30.00; Ithaca high grade hammerless, 12 ga. 30 in. full and modified, perfect, $38.00; 1899 Savage .303, 26 inch octagon barrel, good, $18.50; 1894 Winchester Carbine, .30-30, fair, $15.00; Mauser 8 mm. with sporting stock, good, $17.00; 1895 Winchester .30-03, Lyman receiver sight, fine, $30.00; Colt Frontier, 44-40, 7½ in. new, $24.00; Colt Frontier, .38-40, 7½ in. fine, $18.00; Colt New Service, .44-40, 5½ in., good, $16.00; Colt .32 Auto., good, $12.00; Smith & Wesson .38 tip-up, 4 in. good, $10.00; Smith & Wesson .22 revolver, fair, $4.00; Savage .380 Auto., good, $13.00; Winchester tool and mold .44-40, $2.00; Win. tool and mold, .38-55, $2.00; 80-, 40-65 smokeless cartridges, $2.50; Sporting stock for Springfield, new, $16.00. Ray Nelson, Roy, Utah. 198

WANT—Pocket Auto., 10 ga. shotgun, .45 Auto. and 9 m m. Luger cartridges. EXCHANGE—750 UMC Smokeless .38 Colt and 500 L. R. .22 ctgs. Pair boxing gloves. Sandow dumb bells. New Krag barrel only. H. & R. 7 shot 4 inch .22 cal. Stevens 414 Quick Lock, .22 L. R., fine. 500 full resized Springfield empties. Field Glasses. .45 Auto Colt. Cash. W. E. essler, 1105 Maple St., Des Moines, Iowa. 200

FOR SALE—Malcolm No. 4 Rifle Telescope 6 X. complete, with mounts, $15.00. Also .22 L. R. N.R.A. Model 1919 Savage, good condition inside and out, price $13.50. L. W. Sult, 416 E. Front St., Berwick, Pa. 220

FOR SALE—400 Remington 7.62 ctgs., $8.00. Fox-Niedner combination rifle and shotgun, 16 ga., .25-35, new. Best offer takes it. Ira Sweet, Knoxville, Pa. 202

SELL OR TRADE—.38 S. & W. Special, 6 inch barrel, fine inside, good outside, $28.00. .38 Military Colt auto., 6 inch barrel, fine inside, good outside, $28.00. .38 Military Colt auto., 6 inch holster, good, $30.00. .41 Swiss Veterlee rifle, new, $6.00. Russian sporter, new, $10.00. WANT—Star-gauged Springfield .30-03 as issued. Must be fine. .22 short Win. musket or .414 Stevens, good. .45 Colt auto., new model, fine. .45 S. & W. 1917 model fair and cheap. Crossman air rifle, good. Air pistol, good. .22 Springfield or new model 52 Win., fine. What have you? Max Wagner, Alexandria, Minnesota.

FOR SALE—380 U. S. 220 grain S P. bullets for Krag. First $6.00 takes them. A. L. Ryan, North Girard, Pa. 204

WALNUT STOCK BLANKS: A good plain walnut blank for remodeling military rifles $1.50, fancy figured $3.50. Extra farcy figured curly, $6.00. Short stocks $1.00, $2.50, $5.00. These are cut close to shape but not milled for barrel and receiver. Clarence Harner, Springfield Ohio. 216

FOR SALE—U. S. Grag Rifle, as issued, A-1 shooting condition. A bargain at $10.00. 500 rounds ammunition for Krag $11.00. Henry H. Marx, Cottonwood, California. 217

WANTED—A 4 inch barrel, in good condition, for .38 Special Smith & Wesson, Model 1905. Bert Laws, Guerneville, California. 221

FOR SALE—One set brand new steel shaft golf club, Driver Brasie, Driving Iron, Midiron jigger, mid-mashie, mashie niblic putter, $35.00. One set clubs used once with new bag, seven clubs in all the set, $25.00. Will take Winchester Model 12 shotgun or Springfield .22 cal. rifle. Also Ithaca 10 ga. C. C. Snavely, Albert Lea, Minnesota. 222

FOR SALE—Ballard A-1 target rifle engraved action set triggers; Schuetzen stock target sights. Three barrels .22 L. R. Win., .32-40 Zischang, .44-100 Ballard. Many shells, tools, etc., $75.00. Stevens Armory rifle, .22 short; target sights sling-strap, $18.00. Ballard .38-55 target rifle, pistol grip; shells, tools, etc., $22.00. Nathan Spering, Room 204, Broad Street Station, Philadelphia, Pa. 223

FOR SALE—Ithaca No. 4, 12 ga. 26 inch barrel, left full right cylinder, with cowhide case, $60.00. One fox grade A. E. 12 gauge, 30 inch full lock barrels, case, $45.00. .35 Rem. Autoloading rifle, case, $4.00. One .38 S. & W. Special Police model, square butt, 5 inch barrel, holster, 200 cartridges and B. & M. loading tool, $25.00. Colt's .22 Auto., $15.00. One Winchester Model 52, with Fecker 6-7 scope case, $50.00. Autographic Kodak Special No. 1-A Bausch & Lomb F. 6.3, lens case, $35.00. Carl Zeiss 12 x 40 m.m., case, $45.00. All goods are in new condition. Reason for selling, owner sick. Henry Schultz, 342 W. 35th St., New York City. 213

FOR SALE—Colt Lightning repeating rifle .32-20 cal., Lyman rear Sheard front, perfect condition, $30.00. Win. S. S. Sporting .22 cal. round barrel, as new, Lyman sights, $2.00. Another same octagon barrel, open sights, $20.00. S. S. Heavy octagon Rem. 25 rim fire as new $12.50. Colt 12 ga. hammerless 30 in. Damascus, highly negraved, gold inlaid. Perfect. $80. Win. 97 Tournament, fine, $40.00. Several fine old Colt cap and ball Rev. $10.00 each. Clarence Harner, Springfield, Ohio. 215

WANTED—Patterson, Dragoon, and Bisley Colts. Kentucky flint rifles. North Berlin, North and Chaney, Richmond and Harpers Ferry pistols. Wesson 1855 .22 cal. revolvers. Specify in detail, cals., length of barrels and condition. S. H. Croft, 33rd & Market St., Phila., Pa. z

FOR SALE—Remington special target rifle, fine checkered stock, Lyman sights, $20.00. New Mauser .32 Auto., $10.00. WANT—.44 Winchester and 12 ga. Smith, Fox or Winchester pump. E. R. Fraser, 598 Delaware Ave., Marion, Ohio. 201

TRADE—Winchester 94, .30-30, 26 inch octagon, Lyman sights, good condition. WANT—Winchester 92 or 53, .44 cal., also Win. '97, 12 ga. shotgun, fine, 32 full, solid frame. WANT—16 or 20 full, 97 preferred. Otto Nordstrow, Fairburn, South Dakota. 218

FOR SALE—One 23.40 S. S. Stevens target rifle. Dubble set trigger peep sight front ivory, equipped for scope and plumb bob. Has Schuetzen stock, good condition, cost new $125.00. Will take $75.00 cash. A. J. Glick, Fulshear, Texas. 206

TRADE—Brand new .22 cal. Colt Auto. Pistol, Patridge sights, checked trigger, for S.A. Army Colt .44 Special or .45 cal. 7½ inch barrel equal to new. Also will sell for cash only. One No. 48 Lyman rear sight with short slide, and one No. 17 Lyman front sight, both in new condition and for Springfield '03 rifle. Make offer. H. R. Wollard, Box 1093, Burke, Idaho. 207

FOR SALE—One absolutely new .25-20 Bolt Action Savage Rifle, never fired, with one extra magazine and one box of cartridges, Western make and loaded with lubaloy soft point bullets. Price $20.00 for all. W. Rohrbacher, 851 E. 6th St., Erie, Pa. 208

FOR SALE—Model 10, .280 Ross, fine inside stock, slightly scratched, $50.00. Model 14, .303 British Enfield, fine, $20.00. 4½ power sporting telescope slight, perfect, $12.00. WANTED—22 inch, 8 power, large objective Fecker scope. Keighley, 612 W. 135th St., New York City. 210

FOR SALE—Grag .30 cal. U. S. Rifle. Refinished stock, shortened forearm, ivory bead front, extra blade front sight, barrel in absolute new condition, will sell for $15.00. Edward Price, Jr., 1411 Rural St., Emporia, Kansas. 211

FOR SALE—Some fine Winchester 94 .30-30 and .32 Special rifles $20 to $25. Fine 94 25-35 carbine $20.00. Colt slide action .32-20 in good serviceable order, a rifle you can use as well as a rare gun, $5.00. Remington .30 Auto, perfect $45.00. 1917 Enfield all new parts including barrel. New Remington Model 30 stock, in fact identical to a new Remington 30 except sights, only $30.00. Brand new Savage .300 bolt factory sights never shot $40.00. Winchester 95 .30-06 solid frame perfect, gold bead front and receiver rear sights, $38.00. Same in .30-40 caliber, slightly used, $35.00. Same in Musket model and .30-06 caliber, good condition, $30.00. New star-gauged Springfield with 1922 Sporter stock grip checked, star-gauge record card with it. Sheard gold bead front and Lyman peep on cocking piece, $40.00. Remington Model 25 32-20 brand new $32.00. Same model .25-20 Marble peep rear fine shape, $27.00. Same shows little more use, regular sights, $23.00. Winchester 92 take-down .44 half magazine perfect, new condition, slightly shop worn, never used, a peach of a rifle $30.00. Some perfect .25 Colt Auto. pistols $12.00 each, same condition .22 Colt Auto. $28.00, same condition, Colt .32 auto. pistols, $16.00. Colt New Service .45 7½ inch barrel, brand new, never used, $28.00. S. A. Army Model .45 Colt perfect condition, 4½ inch barrel, $25.00. Winchester .351 Auto, fine condition, $35.00 with one box cartridges, 3 boxes Winchester make .401 Win. Auto. ctgs., all for $3.00. 900 Savage soft point .250 bullets $2.00 per 100, regular value $2.70. A few .30 caliber Wester T. & Copper Wks. bullets, closing out at half price. Will take Remington Auto. or Win. 1912 shotguns or any high grade double hammerless guns, specially 16 and 20 gauges preferred in exchange. Geo. A. Goeke, 15 East Main St., Waukon, Iowa. 228

FOR SALE—One National Match rifle with sling thong case complete. P. J. O'Hare front and rear sight cover. A-No. 1 shape. $36.00. One Springfield sight micrometer gauge, new, $4.50. One Colt .22 Target Automatic, new in original grease with special holster. Will trade for good sporter 1903 or take $32.00 complete with leather holster, pay postage. One .22 cal. Marlin Model 39-A No. 1 shape. Will trade for good single shot .22 in special target grade. One Ross Sporter .303, with 50 Lyman receiver sight. Will take $21.00 or trade for case of 1200 Western cartridges if loaded with Du Pont Powder. One brand new Savage bolt 1920—cost $62.25 with 54 Lyman rear sling and Marbles' right, shot eight times, perfect. Equipped at factory. $57.25 money order takes it. One brand new .22-32 Smith & Wesson target with holster, in original box. Cost $32.00—take $20. H. N. Bundy, No. 7, Topeka, Kansas. 225

FOR SALE—Colt's .45 New Service 7½ inch, good, $14.00. Remington U. S. Model '17 .30-06, action and barrel fine, rough cut P. G. stock, $12.50. Lloyd Davis, Charlemont, Mass. 219

FOR SALE—Mod. 12 Winch. 20 gauge, full choke, canvas case, $30.00. .44-40 loading tool and mould, $3.00 Winchester make. All in fine condition. Send M. O. or draft. H. M. Stebbins, Box K, Norwich, N. Y. 205

FOR SALE—Fine pre-war Sauer Mauser .30-06 ribbed barrel, Lyman 48 gold bead, sighted in for Rem. Express load. Very accurate. $60 C. O. D. examination allowed. Write, B. Cottrell, Harrison Valley, Pa. 230

FOR SALE—.30-40 Win. S. S., T. D. 30 inch No. 3 round barrel, Lyman sights, Nos. 103 and 17, sling swivels, canvas case, B. & M. handloading tools, a few loaded cartridges and about 200 empties. Also interchangeable .25-35 W. C. F. 30 inch No. 3, round barrel to use in same action. All in first class condition. $75.00. Louis Kelsey, 1940 N. Judson St., Philadelphia, Pa. 231

FOR SALE—All in gun crank condition. One Remington Model 30, 3.0-'06, bolt lock, restocked, not checked, $60.00. One Smith & Wesson .22 cal. target pistol, new, 10 inches, Olympic barrel, $25.00. One .22 cal. Springfield, Lyman aperture front sight, fine condition, $35.00. One Sharps hammerless, Pope .38 cal. uses .38-72 shells and 330 gr. patched bullets, like new, has made possibles at 200 yds. on rest target, $65.00. One Hepburn action Niedner 22-21 No. 3 barrel, Win. scope blocks, $25.00. One Maxim Silencer for Krag or Springfield, $8.00. One set new Winchester reloading tools .44-40, $3.00.

One Pope mould, .33 cal. 192 gr., $3.00. One Pope mould .33 cal., pointed, $3.00. One Ideal powder measure, old style, $1.50. Ideal moulds in fine shape, like new, each, $1.50. No. 22637-32 gr.—.28 cal. express, 120 gr. No. 22636-40 gr.—No. 302284-207 gr.—No. 257312. No. 32362-83 gr.—.52-40 for patched bullet. One Ideal tool and mould .32 long, $2.50. One .25 cal. mould to cast 3 bullets, aut. cutoff, $3.00. One .33 cal. Pope-Ballard, double set triggers, palm rest, engraved action, all tools, very accurate, in extra fine order, $75.00. Thos. Shelhamer, 510 Spruce St., Dowagiac, Michigan. 209

SELL OR TRADE—One C. L. Guinand split times, in fine condition, gun metal case, 16 size, for .45 cal. Colt S. A. No objection to bluing, condition must be good inside. Henry Dietrich, Holgate, Ohio. 212

"IF IT'S GUNS ASK ZINNER"—Your used gun taken in trade on new. Large stock on hand. No catalogue. Write me what you want and what you want to trade in. Henry F. Zinner, Dealer in Guns, etc., Middlegurgs, Schoharie Co., N. Y. G

FOR SALE—1 3-A Special 3¼ x 4¼ Eastman Kodak F6.3 Anastigmat Lens. Excellent condition. Price $30.00. Lawrence H. Lapinske, 201 Seymour St., Wausau, Wisc. 214

FOR SALE OR TRADE—D. H. E. Parker 16 ga. ejector in factory condition used on about three hunts last season stock 15¾ x 2⅝ x 14, 26 inch bbls. bored 150 pellets right 200 left, with extra set of 20 inch barrels bored 180 right, 220 left for $225.00. Cost with fine case holding both barrels over $275.00. Will trade for light American double preferably 16 ga. bored for quail of equal value. CE Fox ejector 12 ga. 30 inch barrels in new condition about same stock dimensions as above for $80.00. Krag carbine new stock, Lyman bolt sight with new barrel. (Sporter barrel as supplied by DCM on Sporting model Springfield, same outside dimensions as 1922 .22 Springfield) rechambered by Niedner with .602 neck clearance and with same throating as Springfield to handle .30-06 bullets from 220 to 110 gr. This rifle fired about ten times to line up sights, for $25.00. Krag rifle with carbine stock in good condition with Lyman No. 34 rear ivory front $18.00. Ideal Loading Press to load both .30-06 and .30-40. All parts necessary for .30-06 with exception of decapping shank in factory condition with about $10.00 worth of extra new parts for .30-40. $28.00. Dunlap Roddey, Rock Hill, South Carolina. 224

FOR SALE OR TRADE—For 52 Winchester Sharps Burchard .25-20 with Government side mount telescope, moulds, etc., barreled by Peterson. Price $25.00. C. R. Anderson, Box 348 Mason City, Iowa. 226

FOR SALE—New cowhide leather traveling bag, leather lined, 20 inch size, men's tan color and Meisselbach free spool reel in fine shape for Colt's .22 automatic pistol. Wm. A. Schmaltz, 818 River St., Alpena, Mich. 227

FOR SALE—Factory new Sporting Mauser with fine Gerard Scope, checked pistol grip carved for end and cheek piece, raised rib sight, quick action scope, set triggers. $33.00. Savage .22 long rifle, mounted scope, fine clean, polished stock, $22.00. First Money Order. Milton P. Ward, 4907 Jackson Blvd., Chicago, Ill. 233

FOR SALE—One Springfield or heavy rifle, 27 inch barrel, with Fecker 6-X telescope. Lyman 48 sight rear, Ramp front sight base. With three different types of aperture front sights. Pistol grip stock of Circassian walnut, Buffalo horn forearm tip and sponge rubber recoil pad. Service sling, barrel perfect, targets furnished. Price $165.00. One Springfield Sporting Rifle, Lyman 103 sight. Ramp front sight base and gold bead front sight, sight cover, sling pistol grip stock of Circassian walnut, price $125. One Krag sporting rifle with special 24 inch barrel of medium weight. Lyman 1-A sight on cocking piece, front service base and regular service sight, pistol grip stock of Circassian walnut, quick release swivels with Whelen sling, price $100.00. Rifles are in first class condition. One Colt cal. .45 revolving Frontier Model 7½ inch barrel, price $10.00. One Krausse 12-X Binoculars in leather case with carrying straps, in new condition. A very fine glass and compact. Price $50.00. One U. S. Army Officers' sword engraved, in scabbard and chamois case, price $8.00. 2 heavy engraved butt plates, very fine engraving, $15.00 each. One checked and engraved butt plate, $10.00. One German silver pistol grip cap engraved $7.00. One pistol grip cap, steel, sides engraved, initials ground off top, $4.00. Engraved screws with butt plates and pistol grip caps. No C. O. D. shipments. Check or money order must accompany order. James V. Howe, 1596 Maple Road Cleveland Heights, Cleveland, Ohio.

FOR SALE—Colt Auto. .22, $20.00. Colt S. A. .38-40, 5½ inch barrel. Sheard front, S. & W. target, rear sights, $20.00. Both practically new. .30-40 Adolph falling block rifle, set triggers, good condition, $17.50. A. B. Crow, 225 Carmel Ave., Piedmont, Calif. 235

FOR SALE—Plain Ballard Action Rifle, No. 6 Barrel, 30 in. long, .25 caliber rim fire Stephens Long Rifle, made over by Peterson, Schuetzen style stock made by Peterson only shot a few times. Good as new. Price $55.00. A. S. Mingle, Pendleton, Indiana. 232

WANTED—Winchester S. S. action; Remington .50 cal. Pistol; Colt New Service Target or Officers' Model; Whelen book on gunsmithing; Belding & Mull or Fecker scope; rifle barrel .50 cal.; cartridges for .50 cal. Remington Pistol and 7.65 Luger Auto. or empties; screw cutting lathe; bench circular saw. FOR SALE—Stevens .22 cal. tapped for scope; Remington Hepburn .32-40 Schuetzen Target Rifle; Sharps Borchardt Schuetzen Target .22 Zichang barrel; large elk head unusual size twelve point. C. Vonrick, Box 37, Wilkes-Barre, Pa. 234

WANTED—7.62 Russian *as issued*, also ammunition for same. Walter Norem, Bryant, Wis. 238

FOR SALE—Springfield Sporter, star gauged, 22 inch barrel, matted front sight ramp with large gold bead fixed aperture rear sight. Fine checkered walnut stock by Griffin & Howe, checkered tran butt plate and Horn cap, Whelen sling and swivels Test fired only, absolutely new. Complete with cleaning tube and funnel. $110.00. Cost me over $140.00. J. M. Hilborn, 43 East 19th Street, New York City. 237

FOR SALE—Savage Sporter. Brand new 5 shot .22 L. Rifle, $15.00. Never used, 3 months old. Don't fail to take advanaige of this offer. First postal card will hold the rifle. W. Kreutz, 5718 Goener St., St. Louis, Mo. 239

FOR SALE—Stevens No. 368 6X telescope, 16 in. long with No. 8 mounts and blocks. A1 condition except finish worn. Price $13.75. Also Stevens No. 388 8 x 20 in. scope with No. 8 mounts and blocks, same condition as the No. 368 glass, price $14.75. I will guarantee either one. Ben Herr, Lebanon, Indiana. 240

FOR SALE—Savage Model 1920 bolt action .250-3000 in a No. 1 shape inside and out, fitted with Lyman's Front and Rear windgauge, sights and sling, price $40.00, or Win. A-5 scope and $20.00. In fine shape. Paul Gibson, 713 Delaware Ave., Oakmont, Pa. 241

WANTED—Revolvers: Want .38 S. & W. hammerless short barrel blued .38 S. & W. Special, target sights 6½ inch barrel blued; .44 S. & W. Russian Model, single action, target sights blued .45 S. & W. Schofield Model, single action, also Ideal mould for .44 Russian marked .431—. Describe and state lowest cash price. H. A. Brandes, 305 Rust Building, Tacoma, Washington. 250

FOR TRADE—Parker Bros., 12 ga. double barreled hammerless, in good shape for Winchester pump 12 or 16 gauge. S. H. McGinness, Brewster, Ohio. 243

FOR SALE OR TRADE—Ballard .22, 7½ lbs., case hardened receiver, 24 inch 8 groove target relined barrel, drilled for scope. Winchester target sights, large fore end, sling swivels, original stock straightened, tight action, A-1 shape, $20.00 or S. & W. .32 police 6 inch barrel. A. B. Crow, 225 Carmel Ave., Piedmont, Calif. 244

Ballistic Series No. 5

This is the fifth of a series of advertisements discussing in detail various WESTERN metallic cartridges. We suggest that you retain this information for your notebook. The target at the right is a reproduction of a group made at 100 yards with regular factory-run Marksman cartridges. The exact degree of accuracy obtained depends partly upon the barrel used. We suggest that you try this remarkably close shooting cartridge in your favorite rifle.

The Marksman 22 Long Rifle

The .22 Long Rifle cartridge is primarily a target load although it is used to some extent for small game shooting, especially with the hollow point bullet. It is simple and inexpensive and yet offers a degree of accuracy second only to the .30-'06 at ranges up to 200 yards. The .22 Long Range has done more than any other one thing, especially during the past few years, to stimulate rifle shooting and to improve marksmanship.

The WESTERN Marksman is an especially accurate .22 Long Rifle cartridge designed particularly for the use of the target shooter. The WESTERN Research Staff has always expected of this cartridge even a higher degree of accuracy than that demanded by the most exacting small bore riflemen. As a result, a great deal of experimental work has been done on this cartridge and it is held to closer limits in manufacture than any other with the exception of the .30-'06.

Recent refinements in the Marksman cartridge have led to its adoption by some of the country's best small bore shooters. They find that it gives them a degree of accuracy which they previously considered impossible. The exact size of the groups obtained at different ranges is dependant partly upon the barrel but the group illustrated above gives you an idea of what you may expect.

If you plan to enter any of the many small bore matches this year, we welcome your inquiry and will gladly supply you with any information that you may want. Detailed ballistics of the Marksman cartridge are given below:

Weight of bullet—40 grains.
Muzzle Velocity—1100 ft. sec.
Type—Solid and Hollow Point lead.
Velocity at 100 yards—905 ft. sec.
Muzzle Energy—112 ft. lbs.
Energy at 100 yards—80 ft. lbs.
Trajectory:
Midway of 100 yards—5.5 inches.
Midway of 200 yards—25.8 inches.

Adapted to practically all repeating and single shot rifles of this caliber, also revolvers and pistols.

Ammunition Dope Free

If you are puzzled by any questions pertaining to arms or ammunition, let the WESTERN Research Staff solve them for you. The men who perfected such outstanding developments as the accurate Marksman .22 Long Rifle cartridge, Lubaloy, Boat-Tail and Open Point Expanding bullets, the .30-30 High Velocity cartridge and others, are at your service. Literature describing these various metallic features as well as Super-X, Xpert, Field and other WESTERN shotgun shells, will be gladly sent upon request.

WESTERN CARTRIDGE CO., 725 Broadway, East Alton, Ill.

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AMMUNITION

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75-PRECISION-200

Precision—The Superior Ammunition


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Felix Arauez, rated as the best pistol shot in the world, tells us that he never fired ammunition that gave him as much satisfaction as Precision. The best riflemen in the United States and Great Britain tell us the same thing. There must be something in these favorable comments.

The champions whose likenesses appear in this advertisement are all users of Precision. One writes: *"I have always found Precision uniform in performance."* Another writes: *"The accuracy of Precision is truly remarkable and when used in the model 52 it is absolutely accurate."* We receive thousands of such testimonials yearly.

There isn't any question in the minds of the experts which .22 calibre ammunition is the best. You can ascertain this first hand by going down the line at Sea Girt, Fort Sheridan, Camp Perry, or whereever small bore tournaments are held.

The shooters know when they use Precision that they have an ammunition which gives accuracy, dependability and service. When one knows he is using ammunition with these combined qualities he has confidence in his ability.

Precision 75 and Precision 200 were designed to give extreme accuracy, one at the short range, the other at the longer ranges. Precision 75 is uncrimped and is loaded with Lesmok powder and 40 grain bullet to give muzzle velocity of approximately 990 feet per second. Precision 200 is crimped, loaded with Lesmok powder and 40 grain bullet to gives muzzle velocity of approximately 1050 feet per second.

Precision holds the same place in the ammunition field that the model 52 does in the rifle field. It is the best made. They are also made for each other. Now is the time to arrange for your supply of Precision for use at Camp Perry, and for the competitions of the coming winter.

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The universal equipment for those who wish to excel on the rifle range is the Winchester trio, the model 52, Precision, and the 5A scope. This combination inspires confidence. Use it.

NEW YORK UNIVERSITY

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The Sinking of the Merrimac

On June 3rd, 1898, in the stifling darkness before the Cuban dawn, a blacker shape crept slowly into the mouth of Santiago Harbor, where Cervera's Fleet lay waiting its chance to attack—or escape.

The collier Merrimac, manned by Lieut. Richmond Pearson Hobson and a daring crew of volunteers. Slowly she swung across the narrow entrance to the harbor and . . . a wandering searchlight, lazily sweeping the surface of the waters, picked her up.

The Spanish batteries awoke, and in a hurricane of shot and shell, the Merrimac's sea-cocks were opened and she slowly sank, bottling up the Spanish Fleet.

Hobson and his men escaped on a raft, and as morning broke, the heroes of the Navy were picked up.

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Du Pont Powder has been inseparably connected with the combat history of every organization in the Service. In 1802, practically all du Pont Powder was made for military purposes. Today, 98% is produced for industrial uses.